THE RECORD OF THE CELEBRATION OF THE TWO HUNDREDTH ANNIVERSARY OF THE BIRTH OF BENJAMIN FRANKLIN, UNDER THE AUSPICES OF THE AMERICAN PHILOSOPHICAL SOCIETY HELD AT PHILADELPHIA FOR PROMOTING USEFUL KNOWLEDGE, APRIL THE SEVENTEENTH TO APRIL THE TWENTIETH, A. D. NINETEEN HUNDRED AND SIX

PRINTED FOR
THE AMERICAN PHILOSOPHICAL SOCIETY
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THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA
FOR PROMOTING USEFUL KNOWLEDGE

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PREFACE

At the General Meeting of the American Philosophical Society, held on April 2–4, 1903, the following preamble and resolution, offered by Dr. I. Minis Hays, were unanimously adopted:

Inasmuch as the two hundredth anniversary of the birth of Benjamin Franklin occurs in January, 1906, it is proper that the American Philosophical Society, which owes its existence to his initiative and to which he gave many years of faithful service, should take steps to commemorate the occasion in a manner befitting his eminent services to this Society, to science and to the Nation. Therefore be it

Resolved, That the President is authorized and directed to appoint a committee, of such number as he shall deem proper, to prepare a plan for the appropriate celebration of the bi-centennial of the birth of Franklin, and to report the same to this Society.

The President thereupon appointed the following members to constitute the Committee:

Hon. George F. Edmunds, *Chairman,*
Prof. Alexander Agassiz, Boston,
Pres't James B. Angell, Ann Arbor,
Prof. George F. Barker, Philadelphia,
Prof. A. Graham Bell, Washington,

Mr. Andrew Carnegie, New York,
Prof. C. F. Chandler, New York,
Hon. Grover Cleveland, Princeton,
Pres't Charles W. Eliot, Cambridge,
Pres't Daniel C. Gilman, Baltimore,
Pres't Arthur T. Hadley, New Haven,
Provost C. C. Harrison, Philadelphia,
Hon. John Hay, Washington,
Dr. I. Minis Hays, Philadelphia,
Prof. Samuel P. Langley, Washington,
Capt. Alfred T. Mahan, U. S. N.,
Dr. S. Weir Mitchell, Philadelphia,
Prof. Simon Newcomb, Washington,
Governor S. W. Pennypacker, Harrisburg,
Prof. E. C. Pickering, Cambridge,
Prof. Michael I. Pupin, New York,
Pres't Ira Remsen, Baltimore,
Prof. John Trowbridge, Cambridge,
Dr. Charles D. Wolcott, Washington,
Hon. Andrew D. White, Ithaca,
Pres't Woodrow Wilson, Princeton.

The Committee met for organization at the call of its Chairman, Hon. George F. Edmunds, on May 23, 1903, and after general discussion appointed a subcommittee consisting of Dr. Edgar F. Smith, *Chairman,* Messrs. Angell, Barker, Gilman, Harrison, Hays and Pickering to prepare a plan for carrying out the reso-

lution of the Society and to report the same to the full Committee.

At a meeting held April 6, 1904, the subcommittee presented the outline of a plan of celebration which was adopted.

A Committee was appointed to urge upon Congress that it should order a medal to be struck to commemmorate the two hundredth anniversary of the birth of Franklin, of which there should be a single impression in gold to be presented by the President of the United States to the Republic of France, other impressions in bronze to be distributed under the direction of the President of the United States and certain number to be placed at the disposition of The American Philosophical Society for purposes of presentation.

A Committee was also appointed to request the Legislature of Pennsylvania to make an appropriation to aid in defraying the expenses of the celebration, and at the solicitation of this Committee the following Act was passed.

An Act: Making an appropriation to the American Philosophical Society, held at Philadelphia, for promoting useful knowledge, for the celebration of the two hundredth anniversary of the birth of Benjamin Franklin.

WHEREAS, The two hundredth anniversary of the birth of Benjamin Franklin will occur on the seventeenth

day of January, Anno Domini one thousand nine hundred and six:

And WHEREAS, By his services to the city of Philadelphia in suggesting and promoting the first public library established in this country, the school which subsequently developed into the University of Pennsylvania, the Pennsylvania Hospital, the American Philosophical Society, the formation of the first Masonic lodge established in America, and other institutions of charity and learning;

By his services to Pennsylvania in the defense of its frontier against the French and Indians, in resisting the unjust claims of the proprietors, as a member of the Assembly and its Speaker, as the agent of the Colony in England, as president of the convention which framed the first Constitution for the State, and as president of the State for three consecutive terms;

By his services to all the colonies in defending their rights and advancing their interests abroad, and as a member of the Continental Congress in promoting their development and formation into an independent nation;

By his services to the United States as a Commissioner, and subsequently as their sole Plenipotentiary at the Court of France, during the revolution, under circumstances most difficult and discouraging, which were of decisive benefit and effect in establishing the Independence of the United States, and as a delegate from Pennsylvania to the convention which framed the Constitution of the United States; and,

By his contributions to knowledge, through his discoveries in electrical and other sciences, he earned the grateful remembrance of the people of this State, and it is proper that the approaching bicentenary of his birth should be appropriately celebrated, therefore:

Section 1. Be it enacted, etc., That the sum of thirty-five thousand dollars, or so much thereof as may be necessary, be and the same is hereby specifically appropriated to the American Philosophical Society, held at Philadelphia, for promoting useful knowledge, to defray the expenses of the proposed celebration of the two hundredth anniversary of the birth of Benjamin Franklin.

APPROVED—The eleventh day of May, Anno Domini one thousand nine hundred and five, in the sum of $20,000. I withhold my approval from the remainder of said appropriation, for the reason that the condition of the State revenue does not justify a larger expenditure at this time.

SAML. W. PENNYPACKER.

An invitation to be represented at the celebration was extended to the Congress of the United States, and the following joint resolution was adopted by that Honorable Body:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the invitation extended to the Congress of the United States by the American Philosophical Society of Philadelphia, Pennsylvania, to attend the celebration of the two hundredth anniversary of the birth of Benjamin Franklin, to be held at Philadelphia, Pennsylvania, commencing April seventeenth, nineteen hundred and six, be, and is hereby, accepted.

That the President of the Senate and the Speaker of the House of Representatives be, and they are hereby, authorized and directed to appoint a committee to consist of six Senators and ten Representatives of the Fifty-

ninth Congress to attend the celebration referred to and to represent the Congress of the United States on that occasion.

An invitation was likewise extended to the Legislature of Pennsylvania to be represented at the celebration, and, as the Legislature was not at the time in session, the invitation was forwarded to the Hon. Cyrus E. Woods, President *pro-tem.* of the Senate, and to the Hon. Henry F. Walton, Speaker of the House of Representatives.

The following subcommittees of the General Committee were appointed to carry out the details of the Celebration:

INVITATIONS.—Charles C. Harrison, *Chairman,* S. Weir Mitchell, Albert H. Smyth, Henry C. Chapman, Hampton L. Carson.

ACADEMY OF MUSIC.—Horace Jayne, *Chairman,* Frank Miles Day, Emlen Hutchinson, James MacAlister, Leslie W. Miller.

WITHERSPOON HALL.—Henry G. Bryant, *Chairman,* E. V. d'Invilliers, James W. Holland.

HOTELS.—John Marshall, *Chairman,* R. C. H. Brock, Samuel G. Dixon, Joseph C. Fraley, R. A. F. Penrose, Jr.

RECEPTION.—W. W. Keen, *Chairman,* R. A. Cleemann, Francis B. Gummere, Robert G. LeConte, Andrew A. Blair.

LUNCHEON.—J. Rodman Paul, *Chairman,* Harry F. Keller, Ernest W. Brown.

DINNER.—Stuart Wood, *Chairman,* George Tucker Bispham, Charles E. Dana, John Cadwalader, Charles H. Cramp.

TRANSPORTATION.—George F. Baer, *Chairman,* A. J. Cassatt, Samuel Dickson, C. Stuart Patterson, Theodore N. Ely.

EXECUTIVE COMMITTEE.—Edgar F. Smith, *Chairman,* I. Minis Hays, *Secretary,* Charles C. Harrison, George F. Barker, S. Weir Mitchell, Samuel Dickson, Joseph G. Rosengarten and the Chairmen of the subcommittees.

The Chairman and Secretary were made *ex-officiis* members of all the subcommittees.

The Executive Committee requested Dr. I. Minis Hays to edit this record of the Bicentennial Celebration.

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MINIATURE OF FRANKLIN . . . . . *Frontispiece.*

Painted by Joseph-Siffrein Duplessis, at Passy, about the year 1782.

PORTRAIT OF FRANKLIN . . . . *Facing Page* 31.

Painted by Benjamin Wilson in London in 1759.

The history of this portrait is explained in the following correspondence which was read by Hon. Joseph H. Choate, on April 20, at the American Academy of Music, when the portrait was first shown after its return to this country.

GOVERNMENT HOUSE,
Ottawa, February 7, 1906.

My Dear Mr. President:—The fortune of war and the accident of inheritance have made me the owner of the portrait of Franklin, which Major André took out of his house in Philadelphia and gave to his Commanding Officer, my great-grandfather, General Sir Charles Grey. This portrait, which Franklin stated was "allowed by those who have seen it to have great merit as a picture in every respect," has for over a century occupied the chief place of honor on the walls of my Northumbrian

home. Mr. Choate has suggested to me that the approaching Franklin Bicentennial Celebration at Philadelphia on April 20, provides a fitting opportunity for restoring to the American people a picture which they will be glad to recover. I gladly fall in with his suggestion.

In a letter from Franklin, written from Philadelphia, October 23, 1788, to Madame Lavoisier, he says: "Our English enemies, when they were in possession of this city and my home, made a prisoner of my portrait and carried it off with them."

As your English friend, I desire to give my prisoner, after the lapse of 130 years, his liberty, and shall be obliged if you will name the officer into whose custody you wish me to deliver him. If agreeable to you, I should be much pleased if he should find a final resting-place in The White House, but I leave this to your judgment.

I remain with great respect and in all friendship,

Yours truly, GREY.

THE WHITE HOUSE,

Washington, February 12, 1906.

My Dear Lord Grey:—I shall send up an officer to receive that portrait, and I cannot sufficiently thank you for your thoughtful and generous gift. The announcement shall be made by Mr. Choate at the time and place you suggest. I shall then formally thank you for your great and thoughtful courtesy. Meanwhile, let me say privately how much I appreciate, not only what you have done, but the spirit in which you have done it, and the way in which the manner of doing it adds to the generosity of

the gift itself. I shall have placed on the portrait, which shall, of course, be kept at The White House as you desire, the circumstances of its taking and return. With heartiest regard,

Sincerely yours,

THEODORE ROOSEVELT.

PORTRAIT OF FRANKLIN . . . . . *Facing Page* 71.

Painted, about the year 1766 in London, by David Martin. The original was copied in 1785 by Charles Willson Peale for the American Philosophical Society, and the photogravure is from this copy.

The history of this portrait is explained in the following memorandum attached to the back of the original portrait painted by Martin for Mr. Alexander and now in the possession of Mr. Henry Williams Biddle, of Philadelphia.

The portraite of Benjamin Franklin, LL.D., was painted by Martin, in London, when the Doctor was about sixty years of age. It was ordered and paid for by Robert Alexander, then of the House of William Alexander and Sons, of Edenburgh, and was designed to perpetuate the circumstance of his advice, given in consequence of the perusal of certain important papers. . . . After the death of Robert it decended to his Brother, William Alexander. Jonathan Williams, a grandson of Dr. Franklin's sister, having married the daughter of William Alexander, the portraite has been given to them, to decend

to the eldest male heir perpetually as the joint representative of both Parties. . . .

This disposition is hereby confirmed.

January 1, 1806.

JON^{A}. WILLIAMS.
MARIAMNE WILLIAMS.

Note.—Doctor Franklin was so well satisfied with Mr. Martin's performance & the likeness was deemed so perfect, that he was induced to have a copy made by the same Artist at his own expense, & it was sent to his Family in Philadelphia. It was after his death, left by his will, to the Supreme Executive Council of Pennsylvania, of which he had been the chief, & was accordingly suspended in their chamber. By the new Constitution, the Council of State was abolished & and this poor portraite, became an abandoned orphan, without having any place in which it had a right to hang itself.

The celebrated Peale, a declaired enemy of everything unnatural—took pity on the wretched outcast and has humanely hung it up among his natural curiosities in the Philadelphia Museum.

The foregoing memorandum is copied from the original, in the Handwriting of my Father, Jonathan Williams, and the signatures are those of himself and my Mother. . . . By virtue of the direction contained in it, the above mentioned portraite passed to me, and has continued in my possession since his death. . . .

I hereby in accordance with the disposition made by them bequeath it to my eldest male heir.

November 1, 1828. HENRY J. WILLIAMS.

THE FRANKLIN MEDAL . . . . . *Facing Page* 97.

Designed by Louis and Augustus St. Gaudens.

This Medal was struck in accordance with the following Act of Congress, approved April 27, 1904.

"To enable the Secretary of State to have struck a medal to commemorate the two hundredth anniversary of the birth of Benjamin Franklin, for distribution in connection with the occurrence of the bicentennial anniversary of his birth, on the seventeenth day of January, nineteen hundred and six, one single impression on gold to be presented, under the direction of the President of the United States, to the Republic of France, and one hundred and fifty impressions on bronze, of which one hundred shall be distributed as may be directed by the President of the United States, and fifty shall be for the use of the American Philosophical Society, held at Philadelphia, for promoting useful knowledge, founded by Franklin, five thousand dollars."

THE PROGRAMME

Tuesday Evening, April 17th

At Witherspoon Hall

The delegates, invited guests and members of the Society met in Westminster Hall at 7.45 P. M. and proceeded in a body to Witherspoon Hall

Opening Session—8 o'clock

Address by the President

Reception of Delegates from Learned Societies and Institutions of Learning

Presentation of Addresses

The University of St. Andrews

Conferring of the Honorary Degree of Doctor of Laws, by the Lord Rector, Mr. Andrew Carnegie.
Upon Agnes Irwin, Dean of Radcliffe College.

An Informal Reception was held in the Assembly Room, after adjournment.

WEDNESDAY, APRIL 18TH

IN THE HALL OF THE SOCIETY

on Independence Square

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE

MORNING SESSION 10 A. M.

The Statistical Method in Chemical Geology

By FRANK WIGGLESWORTH CLARKE, Sc.D., of Washington

On a possible Reversal of the Deep Sea Circulation and its Effect on Geological Climates

By PROF. THOMAS C. CHAMBERLIN, of Chicago

Elementary Species in Agriculture

By PROF. HUGO DEVRIES, of Amsterdam, Holland

An International Southern Observatory

By PROF. EDWARD C. PICKERING, of Cambridge, Mass.

The Figure and Stability of a Liquid Satellite

By SIR GEORGE DARWIN, K.C.B., F.R.S., of Cambridge, England

Form Analysis

By PROF. ALBERT A. MICHELSON, of Chicago

EXECUTIVE SESSION—12.30 O'CLOCK

For the transaction of the private business of the Society

STATED BUSINESS—Candidates for membership balloted for

AFTERNOON SESSION—2 O'CLOCK

The Present Position of the Problem concerning the First Principles of Scientific Theory

By PROF. JOSIAH ROYCE, of Cambridge, Mass.

The Human Harvest

By PRESIDENT DAVID STARR JORDAN, of Stanford University, Cal.

On Positive and Negative Electrons

By PROF. H. A. LORENTZ, of Amsterdam

The Elimination of Velocity-Head in the Measurements of Pressures in a Fluid Stream

By PROF. FRANCIS E. NIPHER, of St. Louis

Old Weather Records and Franklin as a Meteorologist

By PROF. CLEVELAND ABBE, of Washington

Was Lewis Evans or Benjamin Franklin the first to recognize that our North-east Storms come from the South-west?

By PROF. WILLIAM MORRIS DAVIS, of Cambridge, Mass.

Notes on the Production of Optical Planes of large Dimensions

By DR. JOHN A. BRASHEAR, of Allegheny, Pa.

A new Mountain Observatory

By PROF. GEORGE E. HALE, Pasadena, Cal.

EVENING SESSION—8 O'CLOCK

AT WITHERSPOON HALL

ADDRESSES

Franklin's Researches in Electricity

By PROF. EDWARD L. NICHOLS, Ph.D., of Ithaca

The Modern Theories of Electricity and their Relation to the Franklinian Theory

By PROF. ERNEST RUTHERFORD, F.R.S., of Montreal

THURSDAY, APRIL 19TH

AT THE AMERICAN ACADEMY OF MUSIC

11 A. M.

THE UNIVERSITY OF PENNSYLVANIA

Conferring of Honorary Degrees

Oration

By the HON. HAMPTON L. CARSON, Attorney General of the Commonwealth of Pennsylvania

AT CHRIST CHURCH BURYING GROUND

Fifth and Arch Streets

4 P. M.

Ceremonies at the Grave of Franklin

The delegates and members assembled in the Hall of the Society at 4 o'clock and proceeded to the Grave of Franklin in the Christ Church Burying Ground at Fifth and Arch Streets.

The American Philosophical Society had requested permission of the Christ Church authorities for the designated representatives of the

institutions with which Franklin was connected either as a founder or a member, and for them only, to enter the grave yard and place wreaths upon the grave of Franklin. This permission was graciously granted by the Vestry "in strict accordance with the terms of the letter" of request—the limitation being necessary to prevent injury to the ancient graves, which completely fill the yard.

In honor of the occasion, the following organizations paraded:

The First Troop of Philadelphia City Cavalry;
A battalion of United States Marines;
A battalion of United States Sailors;
The First Regiment of Infantry of the National Guard of Pennsylvania;
The Veteran Corps of the same regiment;
A provisional battalion of 800 United States Letter Carriers;
The Veteran Firemen's Association;
A deputation from the Grand Lodge of Free and Accepted Masons of Pennsylvania.

The parade was under the charge of Col. Benjamin C. Tilghman as Grand Marshal; and Major George E. Kemp, Major Charles T. Cresswell, and First Lieutenant Henry Norris as Aides.

The parade formed on the west side of Broad Street, facing east, the right of the line being opposite the Masonic Temple, and moved at 4 P. M. over the following route:

South on Broad to Market, passing to the east of the City Hall, east on Market to Twelfth, south on Twelfth to Chestnut, east on Chestnut to Fifth, north on Fifth to Arch, east on Arch to Fourth Street.

When the head of the column arrived at Fourth and Arch Streets, the column halted and was formed to the right.

Wreaths were then placed on the grave of Franklin on behalf of

THE NATION,

By the PRESIDENT OF THE UNITED STATES
through his specially appointed representative,
COMMANDER R. McN. WINSLOW, U. S. N.;

THE STATE OF PENNSYLVANIA,
By the GOVERNOR OF THE STATE,
through his specially appointed representative,
MR. BROMLEY WHARTON, Private Secretary;

THE AMERICAN PHILOSOPHICAL SOCIETY,
By its PRESIDENT, DR. EDGAR F. SMITH;

THE UNIVERSITY OF PENNSYLVANIA,
By PROVOST CHARLES C. HARRISON;

THE LIBRARY COMPANY OF PHILADELPHIA,
By its PRESIDING DIRECTOR, MR. EDWIN S. BUCKLEY;

THE PENNSYLVANIA HOSPITAL,
By its PRESIDENT, MR. BENJAMIN H. SHOEMAKER;

THE PHILADELPHIA CONTRIBUTIONSHIP FOR THE INSURANCE OF HOUSES FROM LOSS FROM FIRE,
By MR. J. RODMAN PAUL, ACTING PRESIDENT;

THE GRAND LODGE OF FREE AND ACCEPTED MASONS OF PENNSYLVANIA,
By the RIGHT WORSHIPFUL GRAND MASTER,
GEORGE W. KENDRICK, JR.;

THE SELECT AND COMMON COUNCILS OF THE CITY OF PHILADELPHIA,
By MR. WILLIAM HARKNESS, CHAIRMAN OF THE COMMITTEE OF COUNCILS;

THE KÖNIGLICHE GESELLSCHAFT DER WISSENSCHAFTEN ZU GÖTTINGEN,
By its DELEGATE, DR. EMIL WIECHERT;

THE KÖNIGLICHE PREUSSISCHE AKADEMIE DER WISSENSCHAFTEN, and
THE UNIVERSITY OF BERLIN,
By their DELEGATE, DR. ALOIS BRANDL;

THE MANCHESTER GEOGRAPHICAL SOCIETY,
By its DELEGATE, J. U. BROWER.

A wreath was also deposited in the name of

THE PENNSYLVANIA SOCIETY OF THE DAUGHTERS OF THE REVOLUTION.

As the wreaths were placed upon the grave, a National Salute was fired by the U. S. Battleship Pennsylvania, anchored at the foot of Arch Street, and the troops in line presented arms, and the unarmed bodies in line uncovered.

Brief addresses were then made under the direction of the Grand Lodge of F. & A. M. of Pennsylvania, as follows:

INVOCATION,
By FRANK B. LYNCH, D.D.;

FRANKLIN IN MASONRY,
By GEORGE W. KENDRICK, JR.;

FRANKLIN AS A FREE MASON,
By JAMES W. BROWN;

FRANKLIN AS A DIPLOMATIST,
By JOHN L. KINSEY;

FRANKLIN AS A SCIENTIST,
By PETER BOYD;

BENEDICTION,
By ROBERT HUNTER, D.D.

At the conclusion of the ceremonies, the parade again formed in column and the march was resumed south on Fourth Street to Walnut, and thence west on Walnut to Broad Street, where the parade was dismissed.

AT THE BELLEVUE-STRATFORD

9 P. M.

Reception

FRIDAY, APRIL 20TH

AT THE AMERICAN ACADEMY OF MUSIC

11 A. M.

The Delegates, Invited Guests and Members of the American Philosophical Society met in the Foyer of the Academy at 10.45 A. M. and proceeded in a body to the Auditorium.

ADDRESSES IN COMMEMORATION OF BENJAMIN FRANKLIN.

As Citizen and Philanthropist

By HORACE HOWARD FURNESS, Litt.D. (Cantab.)

As Printer and Philosopher

By PRESIDENT CHARLES WILLIAM ELIOT, LL.D.

As Statesman and Diplomatist

By the HON. JOSEPH HODGES CHOATE, LL.D., D.C.L.

PRESENTATION OF THE FRANKLIN MEDAL TO THE REPUBLIC OF FRANCE

(In accordance with the Act of Congress)

By the HONORABLE ELIHU ROOT, Secretary of State
(by direction of The President)

RECEPTION OF THE MEDAL

By HIS EXCELLENCY, M. J. J. JUSSERAND,
The French Ambassador

IN THE HALL OF THE SOCIETY

on Independence Square

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE

3 P. M.

Repetition and Variation in Poetic Structure

By PROF. FRANCIS BARTON GUMMERE, of Haverford, Pa.

The Herodotean Prototype of Esther and Sheherazade

By PROF. PAUL HAUPT, of Baltimore, Md.

Heredity and Variation, Logical and Biological

By PROF. WM. KEITH BROOKS, of Baltimore

Notes on a Collection of Fossil Mammals from Natal

By PROF. WILLIAM B. SCOTT, of Princeton

The use of Dilute Solutions of Sulphuric Acid as a Fungicide

By PROF. HENRY KRAEMER, of Philadelphia

Franklin and the Germans

By PROF. M. D. LEARNED, of Philadelphia

The use of High-Explosive Projectiles

By PROF. CHARLES E. MUNROE, of Washington.

Ammoniacal Gas Liquors

By PROF. CHARLES E. MUNROE, of Washington.

The Chromosomes in the Spermatogenesis of the Hemiptera Heteroptera

By PROF. THOMAS H. MONTGOMERY, JR., of Austin, Texas

AT THE BELLEVUE-STRATFORD

Broad and Walnut Streets

7 P. M.

Dinner

NOTE

The papers on subjects of science, read on Wednesday, April 18, and Friday, April 20, appear in THE PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, Volume XLV. 1906.

LIST OF DELEGATES

The Congress of the United States

Hon. Henry Cabot Lodge
Hon. John Kean
Hon. Elmer J. Burkett
Hon. George Sutherland
Hon. Murphy J. Foster
Hon. Asbury Churchwell Latimer
on behalf of the Senate

Hon. Marlin Edgar Olmsted
Hon. Frederick Clement Stevens
Hon. Robert G. Cousins
Hon. James E. Watson
Hon. J. Sloat Fassett
Hon. Rockwood Hoar
Hon. Thomas Alexander Smith
Hon. Edward William Pou
Hon. William Henry Ryan
Hon. John Thomas Watkins
on behalf of the House of Representatives

The State of Pennsylvania

Hon. John M. Scott
Hon. William C. Sproul
Hon. A. E. Sisson

Hon. Algernon B. Roberts
Hon. Arthur G. Dewalt
Hon. David A. Wilbert

The President of France
M. J. J. Jusserand

Il Ministero di Agricoltura, Industria e Commercio (Rome)
Count Naselli

The University of Oxford—XII Century
Mr. Roger Bigelow Merriman

The University of Cambridge—XII Century
Sir George Howard Darwin, K.C.B.

Regia Universita di Pavia—1361
The President of the American Philosophical Society

The University of St. Andrews—1411
The Lord Rector, Mr. Andrew Carnegie
Professor Alfred Mercier

The University of Glasgow—1450
Professor Thomas Gray
Professor William R. Lang
Rev. Duncan B. Macdonald

The University of Edinburgh—1583
Rev. William Paterson Paterson
Dr. S. Weir Mitchell

Reale Accademia di Scienze, Lettere ed Arti in Padova —1599

Professor Simon Newcomb

Reale Accademia dei Lincei, Rome—1603

Professor Simon Newcomb

L'Académie des Sciences de Paris—1629

Professor Simon Newcomb

Harvard University—1636

President Charles W. Eliot

Dr. Horace Howard Furness

The Royal Society (London)—1645

Sir George Howard Darwin, K.C.B.

Professor Ernest W. Brown

Professor Ernest Rutherford

Professor J. W. Mallet

L'Académie Nationale des Sciences, Arts et Belles Lettres de Caen—1652

Professor Rev. Florian J. C. Vurpillot

College of William and Mary (Williamsburg, Va.)—1693

President Lyon Gardiner Tyler

Königliche Preussische Akademie der Wissenschaften (Berlin)—1700

Dr. Alois Brandl

Yale University—1701
President Arthur T. Hadley
Professor Charles S. Hastings

The University of Pennsylvania—1740
Provost Charles C. Harrison

Princeton University—1746
Professor William F. Magie
Professor William B. Scott

Königliche Gesellschaft der Wissenschaften zu Göttingen—1751
Dr. Emil Wiechert

The Society of Arts (London)—1754
Right Honorable Sir H. Mortimer-Durand
Sir William Henry Preece, K.C.B., F.R.S.

Columbia University (New York)—1754
Professor William Milligan Sloan
Mr. John B. Pine

Real Academia de Ciencias y Artes de Barcelona—1763
Hon. George C. Perkins
Mr. George W. Dickie
Mr. Marsden Manson

Bataafsch Genootschap der Proefondervindelijke Wijsbegeerte (Rotterdam)—1769
Dr. H. A. Lorentz

L'Académie de Médecine de Paris—1776
Dr. S. Weir Mitchell

The American Academy of Arts and Sciences (Boston)—1780
President W. W. Goodwin
Professor William Morris Davis

Manchester Literary and Philosophical Society (Eng.)—1781
Dr. F. W. Clarke

Societa Italiana delle Scienze (Rome)—1782
Professor Simon Newcomb

Reale Accademia delle Scienze di Torino—1783
Professor Simon Newcomb

The University of the State of New York (Albany)—1784
Hon. T. Guilford Smith

The College of Physicians of Philadelphia—1787
Dr. J. William White

Franklin and Marshall College (Lancaster, Pa.)—1787
President John S. Stahr

The Linnean Society (London)—1788
Professor William Gilson Farlow

The Massachusetts Historical Society—1791
Vice President Samuel A. Green

The University of Vermont—1791
President Matthew H. Buckham

Bowdoin College (Brunswick, Me.)—1794
Professor Henry L. Chapman

The Royal Institution of Great Britain—1800
Sir George Howard Darwin, K.C.B.

The Library of Congress (Washington)—1800
Mr. Herbert Putnam

The Royal Philosophical Society of Glasgow—1802
Professor Peter Bennett

The New York Historical Society—1804
Vice-President F. Robert Schell

The American Antiquarian Society (Worcester, Mass.)—1812
Dr. Andrew McFarland Davis

The Academy of Natural Sciences of Philadelphia—1812
President Samuel G. Dixon

The New York Academy of Sciences—1817
Professor N. L. Britton
Professor J. McKeen Cattell
Professor J. J. Stevenson

The University of Cincinnati—1819
President Charles W. Dabney

The Royal Astronomical Society (London)—1820
Professor Ernest W. Brown

The Royal Scottish Society of Arts (Edinburgh)—1821
Professor William Morris Davis

Amherst College (Mass.)—1821
President George Harris

The British Association for the Advancement of Science—1822
Sir George Howard Darwin, K.C.B.

The Rhode Island Historical Society—1822
President Wilfred H. Munro

The New Hampshire Historical Society—1823
Hon. Samuel C. Eastman

The Franklin Institute (Philadelphia)—1824
President John Birkinbine

The Historical Society of Pennsylvania—1824
Chief Justice James T. Mitchell

The Connecticut Historical Society—1825
President Samuel Hart

The Zoological Society of London—1826
Mr. Arthur Erwin Brown

The University of Toronto—1827
President James Loudon

The Royal Geographical Society of London—1830
Professor William Morris Davis

The Boston Society of Natural History—1830
Professor Angelo Heilprin

Haverford College (Pennsylvania)—1833
President Isaac Sharpless

The Royal Asiatic Society of Great Britain—1834
Professor Charles Rockwell Lanman

The University of Michigan—1837
President James B. Angell
Professor Charles L. Doolittle

Reale Istituto Veneto di Scienze, Lettere ed Arti—1838
Professor Edwin G. Conklin

The Vermont Historical Society—1838
President G. G. Benedict

The University of Missouri—1839
Acting President J. C. Jones

The American Oriental Society (New Haven)—1842
Dr. Daniel C. Gilman

The Maryland Historical Society—1844
Hon. Ferdinand C. Latrobe

The Smithsonian Institution (Washington)—1846
Hon. Henry Cabot Lodge

The Institution of Mechanical Engineers (London)—1847
Mr. Robert W. Hunt
Mr. Coleman Sellers

The Essex Institute (Salem, Mass.)—1848

Hon. Robert S. Rantoul

The University of Wisconsin—1849

Dr. Richard T. Ely

The Royal Meteorological Society (London)—1850

Sir George Howard Darwin, K.C.B.

The American Geographical Society (New York)—1852

Mr. Levi Holbrook
Mr. Edwin Swift Balch
Professor William Libbey

The North of England Institute of Mining and Mechanical Engineers—1852

Mr. F. C. Keighley

The California Academy of Sciences—1853

Hon. George C. Perkins
Mr. George W. Dickie
Mr. Marsden Manson

Koninklijke Akademie van Wetenschappen (Amsterdam)—1855

Dr. H. A. Lorentz

Kaiserliche Königliche Geographische Gesellschaft (Vienna)—1856

Dr. Eugen Oberhummer

The Institution of Engineers and Shipbuilders (Glasgow)—1857

Mr. Charles H. Davis
Mr. John H. Macalpine
Mr. James V. Patterson
Mr. Andrew Fletcher

The Academy of Science of St. Louis—1857

Professor Francis Eugene Nipher

The Peabody Institute (Baltimore)—1857

Dr. Daniel C. Gilman
Mr. Faris C. Pitt

The Geological Society of Glasgow—1858

Professor Peter Bennett

The Numismatic and Antiquarian Society of Philadelphia—1858

Mr. Cornelius Stevenson

La Société d'Anthropologie de Paris—1859

Professor George Grant MacCurdy

The Buffalo Society of Natural Sciences—1861

President T. Guilford Smith

The Massachusetts Institute of Technology—1861

President Henry S. Pritchett

The Portland Society of Natural History (Maine)—1862

Dr. William Converse Kendall

The National Academy of Sciences (Washington, D. C.)—1863
Professor Edward L. Nichols

Cornell University (Ithaca, N. Y.)—1865
President J. G. Schurman

The New Zealand Institute (Wellington)—1867
Professor Ernest Rutherford

The Davenport Academy of Sciences (Iowa)—1867
Mr. H. S. Putnam

The American Museum of Natural History (New York)—1869
Dr. Hermon C. Bumpus

The Peabody Museum (Salem, Mass.)—1869
Mr. L. W. Jenkins

Istituto Botanico di Pavia—1870
Professor William Gilson Farlow

Deutscher Seefischerei (Verein)—1870
Dr. Herman Boeker

The Cincinnati Society of Natural History—1870
Mr. William Hubbell Fisher

The Torrey Botanical Club (New York)—1870
Professor L. M. Underwood
Dr. T. D. MacDougal

The Wisconsin Academy of Sciences, Arts, and Letters—1870

Hon. John W. Hoyt

The Institution of Electrical Engineers (London)—1871

Sir William Henry Preece, K.C.B.
Mr. Elihu Thomson

The Anthropological Institute of Great Britain and Ireland (London)—1871

Professor F. W. Putnam

The Philosophical Society of Washington—1871

Professor Cleveland Abbe

The Asiatic Society of Japan—1872

Mr. J. C. Hepburn
Rev. G. W. Knox
Rev. W. E. Griffis
Mr. Benjamin Smith Lyman

The Physical Society of London—1874

Professor A. A. Michelson
Professor R. W. Wood

La Société Géologique de Belgique (Liège)—1874

Dr. Persifor Frazer

The Lancaster Co. (Pennsylvania) Historical Society—1874

Dr. Joseph Henry Dubbs
Mr. Samuel M. Sener
Dr. Frank Reid Diffenderffer

La Société Royale de Géographie d'Anvers—1876
M. Henri Thys

The Conchological Society of Great Britain and Ireland (Manchester)—1876
Dr. William H. Dall

The Johns Hopkins University (Baltimore, Md.)—1876
Professor Paul Haupt

The Archaeological Institute of America (Cambridge, Mass.)—1879
President Thomas Day Seymour

The Biological Society of Washington (D. C.)—1880
Dr. Theodore Gill

The Colorado Scientific Society (Denver)—1882
Mr. E. N. Hawkins

The Royal Geographical Society of Australasia (Victorian Branch)—1883
Hon. Col. J. M. Morgan

La Société Internationale des Electriciens de Paris—1883
Mr. Carl Hering

La Société des Sciences Physiques et Naturelles de Bordeaux—1883
Dr. Samuel G. Dixon

Sociedad Cientifica "Antonio Alzate" (Mexico)—1884

Mr. Edwin Swift Balch
Dr. Persifor Frazer
Prof. Angelo Heilprin

The Royal Geographical Society of Manchester—1885

Jacob Vradenburg Brower

The Royal Geographical Society of Australasia, Queensland Branch—1885

Dr. J. P. Thomson

La Société Belge de Géologie, de Paléontalogie et d'Hydrologie (Brussels)—1887

Professor J. J. Stevenson

The American Mathematical Society (New York)—1888

Professor Edward V. Huntington

The Geological Society of America—1888

Dr. Persifor Frazer

L'Ecole d'Anthropologie de Paris—1889

Professor George Grant MacCurdy

The Missouri Botanical Garden (St. Louis)—1889

Director William Trelease

The West of Scotland Iron and Steel Institute (Glasgow)—1892

Professor Henry M. Howe

The Colonial Society of Massachusetts (Boston)—1892
Mr. Henry Herbert Edes

The Engineer's Club of Philadelphia—1892
Mr. Arthur Falkenau

The Geographical Society of Philadelphia—1893
President Henry G. Bryant

The Carnegie Museum (Pittsburg, Pa.)—1896
Director W. J. Holland

The Washington Academy of Sciences (D. C.)—1898
Professor Cleveland Abbe
Professor Frank W. Clarke

The Pennsylvania Society (New York)—1899
Secretary Barr Feree

The Carnegie Institution (Washington, D. C.)—1902
President Robert S. Woodward

Sociedad Aragonesa de Ciencias Naturales
Mr. Philip Calvert

REPORT OF

THE PROCEEDINGS

PHOTOGRAVURE & COLOR CO, N.Y.

BENJAMIN FRANKLIN

FROM THE PORTRAIT BY B. WILSON, PAINTED IN 1759

PRESENTED TO THE NATION, APRIL, 1906, BY THE RIGHT HON. THE EARL GREY, G.C.M.G

AND NOW IN THE WHITE HOUSE, WASHINGTON

FRANKLIN
AS CITIZEN AND PHILANTHROPIST

By Horace Howard Furness

[Address delivered in The Academy of Music, Friday, April 20.]

IN compliance with the request of my fellow associates of The American Philosophical Society, I am to speak to you on the "Character of Franklin as a Citizen and a Philanthropist." And if I dwell chiefly on his Citizenship, it is because it is the larger term, and includes Philanthropy.

The words that I utter cannot be many,—who can compress, within the limits of patience, an account of the trials, and the triumphs of eighty years?—and they must be trite and mere iterations,—for has not Franklin's every deed and word been set before you, within the last few months, in mouths of far wiser censure than mine?

Let us, then, here and now, approach this great memory with the reverence of children and stammer our gratitude by rehearsing some elements of the inextinguishable indebtedness due from every one of us to that great benefactor, to whom, at this very hour, we owe comforts, without which life, civic or social, would be barely tolerable.

If, at the time when Macaulay's 'New Zealander,' standing on a broken arch of London Bridge, is cleaning his palette after a successful sketch of the ruins of St. Paul's, a Philadelphia 'Directory' of the present year should be submitted, as the sole survival of this city, to the eminent archæologists of that distant day, they will find, to their bewilderment, that about thirty trades or manufactures from biscuit-making to bottling, from banks to buttons, from skirt-making to sugar-refining, one and all are preceded by a name or symbol almost as mysterious as that on any cuneiform tablet now unearthed at Nippur. Whereupon, a theory is evolved that all tradesmen had a fetich or totem, called "Franklin." Of course, the Higher Criticism of that day will maintain that it was merely the name of a deified king. Let us project our gratitude to the Higher Criticism on that dim and nebulous horizon for coming so near the truth, nearer possibly than it comes now-a-days, and for discerning the divinity that hedges this Franklin, this king of men. Ay, every inch a king! (An extremely high compliment to kings, let us remark in passing.)

In sooth, for his own fame, Franklin was born too late. Had he lived in ages nearer the beginning, when the childhood of our race was fashioning the images of its gods out of mud and clay in the uncouth likeness of its heroes and benefactors, no station less august than the Father of the World would have then sufficed for him;

and their clay-baked "Jupiter Omnipotens" or, possibly, more appropriately "Jupiter Tonans" would have borne the lineaments of Benjamin Franklin, spectacles and all.

But for us, he was not born too late. No more auspicious star twinkles for us in the firmament than that which shone on the birth of Franklin. Under it, he was endowed with an inappeasible hunger for knowledge; with a temperament so equable that the sight of injustice could alone disturb its poise; with a wisdom so comprehensive that no experience of life, however humble, failed to enlarge it; with a sagacity so sure that it partook of a prophet's fire; with an honesty so ingrained that in his "Autobiography" he would endure disgrace rather than seem to be what he was not; with a sense of humour so keen that it kept him from yielding to the obtrusive vagaries of overwrought enthusiasm. And, to crown all, this happy mingle was born into the world just in time to reach its full maturity when this young nation was struggling perilously into manhood, and on the stroke of the hour when there was needed precisely the very help which a man like Franklin, and Franklin alone, could supply. It is such times,—"times," as Tom Paine then said, "which try men's souls,"—that cry aloud for all the finest elements of citizenship. Then it is that the Commonwealth demands of her sons, from the highest to the lowest, the very all and the very best, they can give, and at the sacrifice of every other tie.

Accordingly, at her summons, Franklin obediently broke away from wife and children, from friends who were dear, from fellow-citizens by whom he was revered, from the ease of affluence, to reside in London, where, for ten years, as the agent of refractory rebels, he was treated by the Government and the Tories, with neglect, contumely, and scorn. But, as was said by "Junius" of Wilkes, "the rays of royal indignation, concentrated upon him, served only to illumine, they could not consume him."

So much did it cost, in the Tory England, of that time, to be a faithful citizen of an American colony. But in the American colony itself the atmosphere was far different.

Franklin had reached Philadelphia, a truant from his apprenticeship in Boston, when he was seventeen years old. Of all the thirty thousand inhabitants about him, he knew personally not a single soul, and all the money he had in the world was a shilling in copper and a solitary "Dutch dollar." This dollar is so demoninated by Franklin himself in his "Autobiography," and whenever it has since been mentioned, it is always termed "Dutch," but whether it was more or less than an ordinary dollar, I do not know, yet certain it is that it gives out a contemptuous ring, which magnifies Franklin's poverty and is soothing to our feelings. And yet, within fourteen short years, so deep was the impression made by

his character on his fellow-citizens, that this friendless, penniless boy had been chosen Clerk of the Pennsylvania Assembly, made a Justice of the Peace, and appointed Postmaster.

A career so remarkable, rising so rapidly from absolute pennilessness to competence, from friendlessness to political prominence, may well give us pause. Those early years must assuredly bear in them the promise, whereof the following fifty bore the fruit. What manner of man, then, must Franklin have been when he was young? His portraits have made the venerable appearance of his old age so familiar that we never think of him as a jocund youth. No contemporary testimony will help us. We have only his own "Autobiography" wherein with invincible honesty he presents the worse side of his own character. We must read between the lines of this "Autobiography," if we are to answer this question, and thence draw our conclusions. If we search we shall there find the following picture: It is evening, in New Jersey, on the road to Philadelphia, and a youth of seventeen applies for lodging at a roadside inn; he is footsore after a solitary tramp of thirty miles, his clothes are shabby, dirty, and show the effects of a thorough drenching in the rain of the day before, with the pockets stuffed out with shirt and stockings. He looks suspiciously like a fugitive

from justice, but the inn-keeper was, strangely enough for those days, a man of some education, a doctor, who had been, probably, an itinerant physician, and had travelled somewhat; he took the uninviting tramp in, and while the latter was eating supper entered into conversation with him. They must have had an entertaining, a delightful talk; evidently the rough diamond sparkled and shone, and so dazzled the eyes, and so won the heart of the good doctor that when they parted the next morning the unknown bedraggled boy carried with him the friendship of his host which survived through life. Here is another incident of Franklin's youth, which happened only a few months after he was settled here in this city. The Governor of the Province, Sir William Keith, had been shown a letter of the young Franklin, written, we may well suppose, in his direct and forcible style; he thereupon conceived a high opinion of the writer. One day, therefore, Sir William, "finely dressed," as we are told, called at the printing office where the youth was at work, talked with him awhile and, evidently captivated by the unusual cleverness of his conversation, insisted upon carrying him off to the tavern, just as he was, in his workingman's clothes, "to taste, as he said, some excellent Madeira." This interview led to others, and several times in the next few weeks the Governor invited the young printer to dine with him, "conversing with me," says Franklin, "in

the most affable, familiar, and friendly manner imaginable."

"My heart doth joy," said Brutus just before he fell upon his sword after his defeat at Philippi, "My heart doth joy that yet in all my life I found no man but he was true to me." Therein Brutus pays, unconsciously, the highest tribute to his own truth. It was his honour that evoked honour wheresoever he dealt. When we find, therefore, in Franklin's "Autobiography" or in his "Letters," commendations of his friends as being affable or agreeable, witty or charming, we may know that those qualities were but reflections of himself. How could it be otherwise? He must have been the best company in the world,—never dull; always alert; that active brain was never idle for the thousandth part of a minute; never gloomy, always cheerful; with flashes of wit, and a fund of anecdotes to illustrate the homely problems of life. Thus he must have been as a companion. As a Councillor, a Justice, or a Legislator the smile vanishes and is replaced, for a while, by the furrows of thought. His popularity could have been no secret to those who met him day by day.

From the age of thirty, and for fifty years onward, until the very close of his long life, he was continuously fulfilling the duties of public office, fairly forced upon him by his fellow-citizens, or by the rulers of the

Province. In every emergency, it was to Franklin that his fellow-citizens appealed for counsel, in absolute trust that in his discerning sagacity, in the fertility of his resources, in his promptitude and unwearied self-sacrifice, they would find all needed aid. And never did they appeal in vain. Did Philadelphia happen to be in danger from privateers of France and Spain at war with Great Britain, it was Franklin, the private citizen, who lulled all fears by organizing bands for defence and by raising money to build and equip a battery. Were the Indians threatening the frontiers, it was Franklin, the citizen, who was deputed to confer with the British general on the means of defence, and in so doing, in order to purchase supplies for the soldiers, he advanced his own hardly earned money to the extent of a thousand pounds,—equivalent at the present day to at least five times as much,—which should the English Government fail to repay, meant his financial ruin.

Thus it was, that, in the eyes of his fellow-citizens, towering above all, in his sterling combination of the qualities of a good citizen, he verily anticipated his own electrical discoveries, and, like a lightning-rod, dissipated every ominous cloud that threatened the serenity of the Commonwealth. Under his benign protection there dwelt safety and secure repose.

What wonder then, that when the Province endeavoured to raise money for a defence against the threatening Indians, and encountered the "indescribable meanness" of the proprietaries, William Penn's own sons, in utterly refusing to allow their vast tracts of land to be taxed for this or for any purpose, —what wonder that the distressed colonists should turn to Franklin, the citizen who, of all others, had been their wisest counsellor in the past, and send him to England to petition the King for relief. Of course, he was as successful as was possible in the circumstances and gained great but temporary relief by a compromise,—that "heretic that works on leases of short numbered hours."

It is not my province to speak, you will shortly hear it from a more golden mouth, of his diplomacy on these missions, of his brilliant success in an examination before Parliament, when, for hours, on no throne did there ever beat a fiercer light than on one unassuming, dignified citizen, who, with imperturbable calmness, answered every question triumphantly, and with the tongue, dowered on that occasion, with the Elfin Queen's gift to Thomas of Ercildoun, "the tongue that could not lie," set forth with unflinching frankness the manifold grievances of the colonies. But it does fall, I think, within my limits to urge that this triumph was due to Franklin's absolute mastery of every quality which goes

to the making of a citizen. No detail of civic life was there, with which he was not familiar. Hence whatever else the guise under which he stands proudly forth on this occasion, every word that he uttered, every fibre of his mind, heralds him as the great citizen.

Nor was this citizen's voice, while reverberating in England, ever silent here at home. Again, it is, probably, not within my province to speak about "Poor Richard's Almanacs" or "Father Abraham's Speech" or the issues from Franklin's press. They will be duly set forth by a voice whose music you will soon hear. But I am not encroaching, when I call attention to the pure philanthropy which lies in scattering broadcast over the land maxims inculcating honesty, sobriety, frugality, and industry, the four cardinal points of civic life, couched in proverbs, whereof the wit and pungency drive the meaning home. We could laugh together, sans intermission, by the half hour, over the shrewdness, the knowledge of human nature, the keenness of those winged words, and barbed shafts, all of them feathered with wit and humour; they are popular today, and will be tomorrow and tomorrow, to the last syllable of recorded time, or as long as "laughter holding both its sides" is friend to man. You know, it is reported that Thomas Jefferson said that the reason why Franklin was not deputed to write "The Declaration of Independence" was because he would be sure to put a joke

in it. But is it too much to claim that those maxims thus sinking deep into the minds of men, as possibly no others sink save those of Holy Writ, swayed and moulded the temper and character of this nation in its early impressible years? If, therefore, Franklin is to be regarded as a type, it is because he himself created the species.

As time went on, the weak bantling among nations, these United States, needed a representative in Europe, who could secure for them recognition as a nation, an alliance if possible, and, at all hazards, money. The task seemed well nigh hopeless. Nevertheless, Congress unanimously appointed Franklin, with two others, a commissioner to France. Faithful to his self-sacrificing duty as a citizen, Franklin accepted the appointment, although he was then seventy years old,—many, many years beyond the limit, at which, as we have been recently assured, we cease to be of any use either to the community, to ourselves, or to anybody. But before he left Philadelphia, he performed one act which places him high, very high, in the list of great citizens and of eminent patriots. The life of the nation was very feeble and very flickering. Enthusiasm is truly admirable, but it will not pay salaries nor arm soldiers. A new-born government without either money or credit is as helpless as a new-born child. Franklin's single-eyed devotion to his country

taught him exactly what to do. He gathered all the money he could command, amounting to three or four thousand pounds, certainly of five times the purchasing value that it is at present, and lent it all to the government. This tangible proof, by so cautious and thrifty a man, of confidence in the stability of the government, afforded untold encouragement to his fellow-citizens to follow his example.

Language would be deemed extravagant that should describe the admiration, the adulation, and the respect wherewith Franklin was welcomed in France.

Ah, that name, France, can it be ever spoken by an American, mindful of our early struggles, without bringing "the crimson to the forehead and the lustre to the eye," as the kindled flush of gratitude starts from our heart of heart! I care not for motives. Gratitude recks not of them. The fact remains that under God, we owe to France the success of our Revolution! When above, below, and on every hand, there was naught but gloom and black despair, that dear, dear land rose to us, on the horizon, like a constellation on the brow of night.

It has been happily said that the thought of future applause is like the majestic sound of the distant ocean; present applause is like that same ocean dashed in the face, and requiring a rock to stand it. But nigh a decade of such applause as has never been lavished on living man had no effect on Franklin's granitic,

republican character. The rock withstood the ocean! Now although it may not prove a title to the claim of consummate citizenship that a man has his portrait in bracelets and on snuff-boxes, and his bust in every house, and his likeness in every shop-window, yet it does reveal how thoroughly ingrained are all the best elements of democratic citizenship when all such blandishments fail to have the faintest influence on character or deportment.

> "The glories of our birth and state
> Are shadows, not substantial things,"

and Dr. Franklin returned to his home here the same unbending republican citizen that he was when he left these shores, and among the charges brought against him by envy and party-spirit (we have the highest authority that "woe be unto us when *all* men speak well of us"), I cannot recall any which denied his republican simplicity in garb or demeanor, or one that accused him of aping foreign aristocratic manners. Indeed, his sense of humour kept him from all ostentation; the incongruity,—one of the elements of humour,—between the simplicity of a republic and the gewgaws of a monarchy was too palpable. Moreover, "silks and satins, scarlet and velvet put out the kitchen fire, as Poor Richard says," and "Pride that dines on vanity, sups on contempt, as Poor Richard says." Verily, his

undisguised exultation in being one of the people is revealed in his final solemn utterance to the public; he begins his Last Will and Testament with "I, Benjamin Franklin, Printer."

He was seventy-nine years old when he returned from France, and a few weeks after his arrival was elected President, we should now say, Governor, of the State, and was re-elected unanimously in the two following years. His high standard of the duty a citizen owes to his Commonwealth induced him, notwithstanding his great age, to accept the position. Moreover, did he not know that "the used key is always bright, as Poor Richard says"? He declined to accept any salary for himself, but devoted it all to schools and churches.

In his last year of office his supremacy as a citizen was again acknowledged. He was called upon to aid in framing the Constitution of the United States. He was eighty-one years old, and, while fulfilling every duty required by his presidency of the State, neglected not a single demand on his time or attention as a delegate of this Constitutional Convention. A noteworthy fact has been pointed out by our accomplished Secretary, Dr. Hays, namely, that the signature of Franklin, and of Franklin alone of all the giants in those days, is to be found on the triple pillars of our government, —it is on the Declaration of Independence, on the

Treaty of Peace with Great Britain acknowledging that Independence, and on the Constitution of the United States.

After all, what is it to be a good citizen? Without entering into any analysis, always tiresome, may we not assume that he who leaves the Commonwealth better than he found it, be it even in so humble a degree as the giving or the bequeathing of a good example, or of an honest name, has earned the right to be entitled a good citizen? Apply this test to Franklin and what do we find?

When Franklin was a very young man, the first civic duty that he performed was the reformation of the "night watch," which at that time would apparently compare favourably with that of London, where it had only very slightly improved since the days of Dogberry. The nightly tippling in taverns of the Philadelphia watchmen possibly surpassed that of their London rivals, but their slumbers when on duty were no less profound than those of their British cousins, and what these slumbers were we may learn from Lord Erskine. "A friend of mine," said Lord Erskine, on one occasion, "was suffering from a continual wakefulness, and various methods were tried to send him to sleep, but in vain. At last, his physicians resorted to an experiment which succeeded perfectly; they dressed

him in a watchman's coat, put a lantern in his hand, placed him in a sentry-box, and—he was asleep in ten minutes." After much persevering effort, Franklin at last succeeded in breaking up the old system and in substituting one which was supported by a tax levied in proportion to the value of property.

When Franklin was twenty-five years old, there was not in all America a public circulating library. He began one, and it still survives as "The Philadelphia Library," and is one of the largest in the land.

In a small town mostly of wooden houses, a conflagration in those early days was only a little less alarming than an attack by Indians. Franklin organized the first Fire Company, whereof every member was obliged to keep on hand "six leather fire-buckets, and two bags made of good oznaburg" (whatever that may be) for the preservation of personal effects.

When Franklin was thirty-seven, there was not a single organized scientific society in America. He founded this, our American Philosophical Society.

The first militia law in this State was drawn up by Franklin, and, when a battery was built below the city, he took his turn in the nightly sentinel's watch as a common soldier, although the battery had been built and equipped mainly by his exertions, and he had been offered the colonelcy of the regiment that manned it.

Franklin was the first to propose a public Fast-day in this State and wrote the Proclamation for it, which the Governor adopted and issued.

And all this while he was filling many another civic duty. The Governor put him on the Commission of the Peace; the corporation of the city chose him as one of the Common Council, and soon after, an Alderman; and the citizens at large elected him a Burgess to represent them in the Assembly, and continued to elect him annually for fourteen years, even during his absence in France.

In 1749, when he was forty-three, he planned and started the Academy which finally became The University of Pennsylvania,—now one of the leading universities of the United States, dear to all of us, and, in our own time, re-created by its great Provost, Dr. Pepper, also Franklin's successor as presiding officer of this, our Philosophical Society.

The idea of a public hospital originated in 1751, with Dr. Thomas Bond, but, discouraged by the apathy of his fellow-citizens, he appealed for aid to Dr. Franklin with the plea that there was no carrying through any public-spirited project unless Dr. Franklin countenanced it. Dr. Bond's confidence was not misplaced. Dr. Franklin speedily secured two thousand pounds in voluntary gifts, and then induced the Assembly to contribute as much more. With these sums the Hospital

was built, the earliest in America, and it still stands at Ninth and Pine streets, with its hourly increasing record of beneficence.

All duties are a weariness, but is there any of the minor duties of life more enervating than that of asking for subscriptions to a charity? How eagerly we seek to ameliorate it by converting the appeal into tickets for a Lecture, a Concert, or a Reading,—but the pill is merely disguised,—it has to be swallowed. No one is exempt from the distasteful task. Listen, then, my poor brothers and sisters, to the worldly-wise words of Dr. Franklin. Rules for your guidance may alleviate your woe. "In the first place," says that guide, "I advise you to apply to all those who, you *know,* will give something; next to those about whom you are uncertain whether they will give anything or not, and show them the list of those who have given; and, lastly, do not neglect those, who, you are sure, will give nothing, for in some of them you may be mistaken."

We are the heirs to another bequest from Franklin. In 1756 the city streets were neither paved nor lighted at night. Franklin caused a portion of the street about the market to be paved, and so pleased were the citizens with its manifest comfort and cleanliness that they consented to be taxed for the paving of the whole city. And then followed scavengers, unknown before. And for the lighting of the streets at night Franklin pro-

posed square lamps with ventilation instead of the round globes imported from England, which became immediately smoky and dim.

And for none of his manifold inventions would he take out a patent, but presented them all freely to the public.

Those steel-grey eyes observed everything from the lightning in the skies to an improvement in spectacles, from smoky chimneys to currents in the ocean, from the best rigging for ships to stoves for burning pit-coal.

Franklin's last official act before leaving France, in 1785, was the signing of the treaty between Prussia and the United States. The twenty-third article of this treaty, written by Franklin, constitutes one of the fairest jewels in the crown of his philanthropy,—a philanthropy so broad that it embraces every nation that "heaven's air in this huge rondure hems." It is the article against privateering, and in favour of the freedom of trade and of the protection of private property in time of war. This standard of philanthropy and of justice is so exalted that even yet (I speak under correction), a hundred and twenty years later, the nations of the earth are but just beginning to acknowledge and obey it.

Thus he passed his life. Serving his fellow-citizens for fifty years, breathing the breath of civic devotion into a newly born nation, and welding the hoop of

gold, to bind these brother States in a union which is to be perpetual. Nor was it alone in civic life that he won admiration and reverence; his presence was at firesides in thronged cities, and by smouldering logs in lone frontier cabins, uttering words of counsel, and appeals for the practice of honesty, frugality and industry, driving the counsel home in the irresistible proverbs of Poor Richard.

But let us not be carried away by an undue enthusiasm. In praise of Poor Richard we may exhaust all adjectives and pant for more. But we must never forget that the virtues which Poor Richard inculcates are those which lie on the surface of our work-a-day life,—virtues truly admirable, truly indispensable,—russet yeas and honest kersey noes will be for ever respectable, and life will glide the smoother where they are heeded. But there is a life beyond life, illuminated

> "By the light that never was on sea or land
> The consecration and the poet's dream,"

a life in the music, in the colour of this fair world of God; and when ambition would pierce to this life, we must, as Emerson says, "hitch our wagon to a star." But for all life below the stars, on the level of this homespun world, we may hitch our wagon to Poor Richard.

But I must bring to a close these remarks, fragmentary as they must be in dealing with a character so colossal

and complete as Franklin's. He has at last reached his eighty-fourth year, and the case of that huge spirit is growing old and racked by torturing pain. Yet in the midst of all, but a few months before his death, he placed the supreme crown and effulgent glory on a career of philanthropy by writing an appeal to Congress for the abolition of slavery, that "atrocious debasement," so he termed it, "of human nature." In thus pleading for the very least of his brethren, he laid his just hands on the golden key that opes the palace of eternity, and gained a mansion on the starry threshold of Jove's court.

Bear with me one minute longer while I recall to your memory the conclusions of two letters. I care not how well-known to you they may be. They should be rehearsed until they are as familiar in our mouths as household words. The first is addressed to Washington and was written from Franklin's dying bed: "For my own personal ease," Franklin writes, "I should have died two years ago; but, though these years have been spent in excruciating pain, I am pleased that I have lived them, since they have brought me to see our present situation. I am now finishing my eighty-fourth year, and probably with it my career in this life; but in whatever state of existence I am placed hereafter, if I retain any memory of what has passed here, I shall with it retain the esteem, respect, and affection, with which

I have long been, my dear friend, Yours most sincerely, B. Franklin."

Now listen to the conclusion of the reply: "If to be venerated for benevolence," writes Washington, "if to be admired for talents, if to be esteemed for patriotism, if to be beloved for philanthropy, can gratify the human mind, you must have the pleasing consolation to know, that you have not lived in vain. And I flatter myself that it will not be ranked among the least grateful occurrences of your life to be assured, that, so long as I retain my memory, you will be recollected with respect, veneration, and affection by your sincere friend, George Washington."

Ah, throughout the inflowing tide of time and circumstance, will history ever, ever see again the like of him, the greatest of all our citizens? But let our gratitude, like incense, mount the skies that one such has been vouchsafed to us.

> "There's not a breathing of the common wind
> That will forget him."

The demi-god of war, who brought into millions of homes, bitter sobs and blinding tears, sleeps beneath a lofty dome, with marble angels gazing sadly on his porphyry tomb.

The demi-god of peace, who scattered plenty o'er a smiling land, and brought into millions of homes,

honesty, and frugality, and sterling virtue, lies, as he wished to lie, in the heart, and in the hearts, of the city that he loved, under the humble walls of the churchyard of Christ Church.

" Daily the tides of life go ebbing and flowing beside him,
Thousands of [scheming] brains, where his no longer are busy,
Thousands of toiling hands, where his have ceased from their labours,
Thousands of weary feet, where his have completed their journey."

FRANKLIN
AS PRINTER AND PHILOSOPHER

By Charles William Eliot, LL.D.

[Address delivered in The American Academy of Music, Friday, April 20]

THE facts about Franklin as printer are simple and plain, but impressive. His father, respecting the boy's strong disinclination to become a tallow-chandler, selected the printer's trade for him, after giving him opportunities to see members of several different trades at their work, and considering the boy's own tastes and aptitudes. It was at twelve years of age that Franklin signed indentures as an apprentice to his older brother James, who was already an established printer. By the time he was seventeen years old he had mastered the trade in all its branches so completely that he could venture with hardly any money in his pocket first into New York and then into Philadelphia without a friend or acquaintance in either place, and yet succeed promptly in earning his living. He knew all the departments of the business. He was a pressman as well as a compositor. He understood both newspaper work and book work. There were at that time no such sharp subdivisions of labor and no such elaborate machinery as exist in the trade to-day, and Franklin could do with

his own eyes and hands, long before he was of age, everything which the printer's art was then equal to. When the faithless Governor Keith caused Franklin to land in London without any resources whatever except his skill at his trade, the youth was fully capable of supporting himself in the great city as a printer. Franklin had been induced by the Governor to go to England, where he was to buy a complete outfit for a good printing office to be set up in Philadelphia. He had already presented the Governor with an inventory of all the materials needed in a small printing office, and was competent to make a critical selection of all these materials; but when he arrived in London on this errand he was only eighteen years old. Thrown completely on his own resources in the great city, he immediately got work at a famous printing house in Bartholomew Close, but soon moved to a still larger printing house, in which he remained during the rest of his stay in London. Here he worked as a pressman at first, but was soon transferred to the composing room, evidently excelling his comrades in both branches of the art. The customary drink money was demanded of him, first by the pressmen with whom he was associated, and afterwards by the compositors. Franklin undertook to resist the second demand; and it is interesting to observe that after a resistance of three weeks he was forced to yield to the demands of the men by just such measures as are now

used against any scab in a unionized printing office. He says in his autobiography: "I had so many little pieces of private mischief done me by mixing my sorts, transposing my pages, breaking my matter, and so forth, if I were ever so little out of the room . . . that, notwithstanding the master's protection, I found myself obliged to comply and pay the money, convinced of the folly of being on ill terms with those one is to live with continually." He was stronger than any of his mates, kept his head clearer because he did not fuddle it with beer, and availed himself of the liberty which then existed of working as fast and as much as he chose. On this point he says: "My constant attendance (I never making a St. Monday) recommended me to the master; and my uncommon quickness at composing occasioned my being put upon all work of dispatch, which was generally better paid. So I went on now very agreeably." On his return to Philadelphia Franklin obtained for a few months another occupation than that of printer; but this employment failing through the death of his employer, Franklin again returned to printing, becoming the manager of a small printing office, in which he was the only skilled workman and was expected to teach several green hands. At that time he was only twenty-one years of age. This printing office often wanted sorts, and there was no type-foundry in America. Franklin succeeded in contriving a mold, struck the matrices in

lead, and thus supplied the deficiencies of the office. The autobiography says: "I also engraved several things on occasion; I made the ink; I was warehouse man and everything, and in short quite a factotum." Nevertheless, he was dismissed before long by his incompetent employer, who, however, was glad to re-engage him a few days later on obtaining a job to print some paper money for New Jersey. Thereupon Franklin contrived a copperplate press for this job—the first that had been seen in the country—and cut the ornaments for the bills. Meantime Franklin, with one of the apprentices, had ordered a press and types from London, that they two might set up an independent office. Shortly after the New Jersey job was finished, these materials arrived in Philadelphia, and Franklin immediately opened his own printing office. His partner "was, however, no compositor, a poor pressman, and seldom sober." The office prospered, and in July, 1730, when Franklin was twenty-four years old, the partnership was dissolved, and Franklin was at the head of a well-established and profitable printing business. This business was the foundation of Franklin's fortune; and better foundation no man could desire. His industry was extraordinary. Contrary to the current opinion, Dr. Baird of St. Andrews testified that the new printing office would succeed, "For the industry of that Franklin," he said, "is superior to anything I ever saw of the kind; I see him still at work

when I go home from club, and he is at work again before his neighbors are out of bed." No trade rules or customs limited, or levied toll on, his productiveness. He speedily became by far the most successful printer in all the colonies, and in twenty years was able to retire from active business with a competency.

One would, however, get a wrong impression of Franklin's career as a printer if he failed to observe that Franklin constantly used, from his boyhood, his connection with a printing office to facilitate his remarkable work as an author, editor, and publisher. Even while he was an apprentice to his brother James he succeeded in getting issued from his brother's press ballads and newspaper articles of which he was the anonymous author. When he had a press of his own, he used it for publishing a newspaper, an almanac, and numerous essays composed or compiled by himself. His genius as a writer supported his skill and industry as a printer.

The second part of the double subject assigned to me is Franklin as a philosopher. The philosophy he taught and illustrated related to four perennial subjects of human interest: education, natural science, politics, and morals. I propose to deal in that order with these four topics.

Franklin's philosophy of education was elaborated as he grew up, and was applied to himself throughout

his life. In the first place, he had no regular education of the usual sort. He studied and read with an extraordinary diligence from his earliest years; but he studied only the subjects which attracted him, or which he himself believed would be good for him, and throughout life he pursued only those inquiries for pursuing which he found within himself an adequate motive. The most important element in his training was reading, for which he had a precocious desire, which was imperative and proved to be lasting. His opportunities to get books were scanty; but he seized on all such opportunities, and fortunately he early came upon the Pilgrim's Progress, the Spectator, Plutarch, Xenophon's Memorabilia, and Locke On the Human Understanding. Practice of English composition was the next agency in Franklin's education; and his method—quite of his own invention—was certainly an admirable one. He would make brief notes of the thoughts contained in a good piece of writing, and lay these notes aside for several days; then without looking at the book he would endeavor to express these thoughts in his own words as fully as they had been expressed in the original paper. Lastly, he would compare his products with the original, thus discovering his shortcomings and errors. To improve his vocabulary, he turned specimens of prose into verse, and later, when he had forgotten the original, turned the verse back again into prose. This exercise enlarged

his vocabulary and his acquaintance with synonyms and their different shades of meaning, and showed him how he could twist phrases and sentences about. His times for such exercises and for reading were at night after work, before work began in the morning, and on Sundays. This severe training he imposed on himself; and he was well advanced in it before he was sixteen years of age. His memory and his imagination must both have served him well; for he not only acquired a style fit for narrative, exposition, or argument, but also learnt to use the fable, parable, paraphrase, proverb, and dialogue. Thirdly, he began very early, while he was still a young boy, to put all he had learnt to use in writing for publication. When he was but nineteen years old he wrote and published in London "A Dissertation on Liberty and Necessity, Pleasure and Pain." In after years he was not proud of this pamphlet; but it was nevertheless a remarkable production for a youth of nineteen. So soon as he was able to establish a newspaper in Philadelphia he wrote for it with great spirit and in a style at once accurate, concise, and attractive, making immediate application of his reading and of the conversation of intelligent acquaintances on both sides of the ocean. His fourth principle of education was that it should continue through life, and should make use of the social instincts. To that end he thought that friends and acquaintances might fitly band together in a sys-

tematic endeavor after mutual improvement. The Junto was created as a school of philosophy, morality, and politics; and this purpose it actually served for many years. Some of the questions read at every meeting of the Junto, with a pause after each one, would be curiously opportune in such a society at the present day. For example, No. 5, "Have you lately heard how any present rich man, here or elsewhere, got his estate?" And No. 6, "Do you know of a fellow-citizen . . . who has lately committed an error proper for us to be warned against and avoid?" When a new member was initiated he was asked among other questions the following: "Do you think any person ought to be harmed in his body, name, or goods for mere speculative opinions or his external way of worship?" and again, "Do you love truth for truth's sake, and will you endeavor impartially to find, receive it yourself, and communicate it to others?" The Junto helped to educate Franklin, and he helped greatly to train all its members.

The nature of Franklin's own education accounts for many of his opinions on the general subject. Thus, he believed, contrary to the judgment of his time, that Latin and Greek were not essential subjects in a liberal education, and that mathematics, in which he never excelled, did not deserve the place it held. He believed that any one who had acquired a command of good English could learn any other modern language that he really needed,

when he needed it; and this faith he illustrated in his own person, for he learnt French, when he needed it, sufficiently well to enable him to exercise great influence for many years at the French Court. As the fruit of his education he exhibited a clear, pungent, persuasive English style both in writing and in conversation,—a style which gave him great and lasting influence among men. It is easy to say that such a training as Franklin's is suitable only for genius. Be that as it may, Franklin's philosophy of education certainly tells in favor of liberty for the individual in his choice of studies, and teaches that a desire for good reading and a capacity to write well are two very important fruits of any liberal culture. It was all at the service of his successor Jefferson, the founder of the University of Virginia.

Franklin's studies in natural philosophy are characterized by remarkable directness, patience, and inventiveness, absolute candor in seeking the truth, and a powerful scientific imagination. What has been usually considered his first discovery was the now familiar fact that northeast storms on the Atlantic coast begin to leeward. The Pennsylvania fireplace he invented was an ingenious application to the warming and ventilating of an apartment of the laws that regulate the movement of hot air. At the age of forty-one he became interested in the subject of electricity, and with the aid of many friends and ac-

quaintances pursued the subject for four years, with no thought about personal credit for inventing either theories or processes, but simply with delight in experimentation and in efforts to explain the phenomena he observed. His kite experiment to prove lightning to be an electrical phenomenon very possibly did not really draw lightning from the cloud; but it supplied evidence of electrical energy in the atmosphere which went far to prove that lightning was an electrical discharge. The sagacity of Franklin's scientific inquiries is well illustracted by his notes on colds and their causes. He maintains that the influenzas usually classed as colds do not arise as a rule from either cold or dampness. He points out that savages and sailors, who are often wet, do not catch cold, and that the disease called a cold is not taken by swimming. He maintains that people who live in the forest, in open barns, or with open windows, do not catch cold, and that the disease called a cold is generally caused by impure air, lack of exercise, or over-eating. He comes to the conclusion that influenzas and colds are contagious—a doctrine which, a century and a half later, was proved, through the advance of bacteriological science, to be sound. The following sentence exhibits remarkable insight, considering the state of medical art at that time: " I have long been satisfied from observation, that besides the general colds now termed influenzas (which may possibly spread by contagion, as well as by

a particular quality of the air), people often catch cold from one another when shut up together in close rooms and coaches, and when sitting near and conversing so as to breathe in each other's transpiration; the disorder being in a certain state." In the light of present knowledge what a cautious and exact statement is that!

There being no learned society in all America at the time, Franklin's scientific experiments were almost all recorded in letters written to interested friends; and he was never in any haste to write these letters. He never took a patent on any of his inventions, and made no effort either to get a profit from them, or to establish any sort of intellectual proprietorship in his experiments and speculations. One of his English correspondents, Mr. Collinson, published in 1751 a number of Franklin's letters to him in a pamphlet called "New Experiments and Observations in Electricity made at Philadelphia in America." This pamphlet was translated into several European languages, and established over the continent —particularly in France—Franklin's reputation as a natural philosopher. A great variety of phenomena engaged his attention, such as phosphorescence in sea water, the cause of the saltness of the sea, the form and temperatures of the Gulf Stream, the effect of oil in stilling waves, and the cause of smoky chimneys. Franklin also reflected and wrote on many topics which are now classified under the head of political economy, such as paper

currency, national wealth, free trade, the slave trade, the effects of luxury and idleness, and the misery and destruction caused by war. Not even his caustic wit could adequately convey in words his contempt and abhorrence of war as a mode of settling questions arising between nations. He condensed his opinions on that subject into the epigram: "There never was a good war or a bad peace."

Franklin's political philosophy may all be summed up in seven words—first freedom, then public happiness and comfort. The spirit of liberty was born in him. He resented his brother's blows when he was an apprentice, and escaped from them. As a mere boy he refused to attend church on Sundays in accordance with the custom of his family and his town, and devoted his Sundays to reading and study. In practicing his trade he claimed and diligently sought complete freedom. In public and private business alike he tried to induce people to take any action desired of them by presenting to them a motive they could understand and feel—a motive which acted on their own wills and excited their hopes. This is the only method possible under a regime of liberty. A perfect illustration of his practice in this respect is found in his successful provision of one hundred and fifty four-horse wagons for Braddock's force when it was detained on its march from Annapolis to Western Pennsylvania by the lack of wagons. The military

method would have been to seize horses, wagons, and drivers wherever found. Franklin persuaded Braddock, instead of using force, to allow him (Franklin) to offer a good hire for horses, wagons, and drivers, and proper compensation for the equipment in case of loss. By this appeal to the frontier farmers of Pennsylvania he secured in two weeks all the transportation required. To defend public order Franklin was perfectly ready to use public force, as for instance when he raised and commanded a regiment of militia to defend the northwestern frontier from the Indians after Braddock's defeat, and again when it became necessary to defend Philadelphia from a large body of frontiersmen who had lynched a considerable number of friendly Indians, and were bent on revolutionizing the Quaker government. But his abhorrence of all war was based on the facts, first, that during war the law must be silent, and secondly, that military discipline, which is essential for effective fighting, annihilates individual liberty. "Those," he said, "who would give up essential liberty for the sake of a little temporary safety deserve neither liberty nor safety." The foundation of his firm resistance on behalf of the colonies to the English Parliament was his impregnable conviction that the love of liberty was the ruling passion of the people of the colonies. In 1766 he said of the American people: "Every act of oppression will sour their tempers, lessen greatly, if not anni-

hilate, the profits of your commerce with them, and hasten their final revolt; for the seeds of liberty are universally found there and nothing can eradicate them." Because they loved liberty, they would not be taxed without representation; they would not have soldiers quartered on them, or their governors made independent of the people in regard to their salaries; or their ports closed or their commerce regulated by Parliament. It is interesting to observe how Franklin's experiments and speculations in natural science often had a favorable influence on freedom of thought. His studies in economics had a strong tendency in that direction. His views about religious toleration were founded on his intense faith in civil liberty; and even his demonstration that lightning was an electrical phenomenon brought deliverance for mankind from an ancient terror. It removed from the domain of the supernatural a manifestation of formidable power that had been supposed to be a weapon of the arbitrary gods; and since it increased man's power over nature, it increased his freedom.

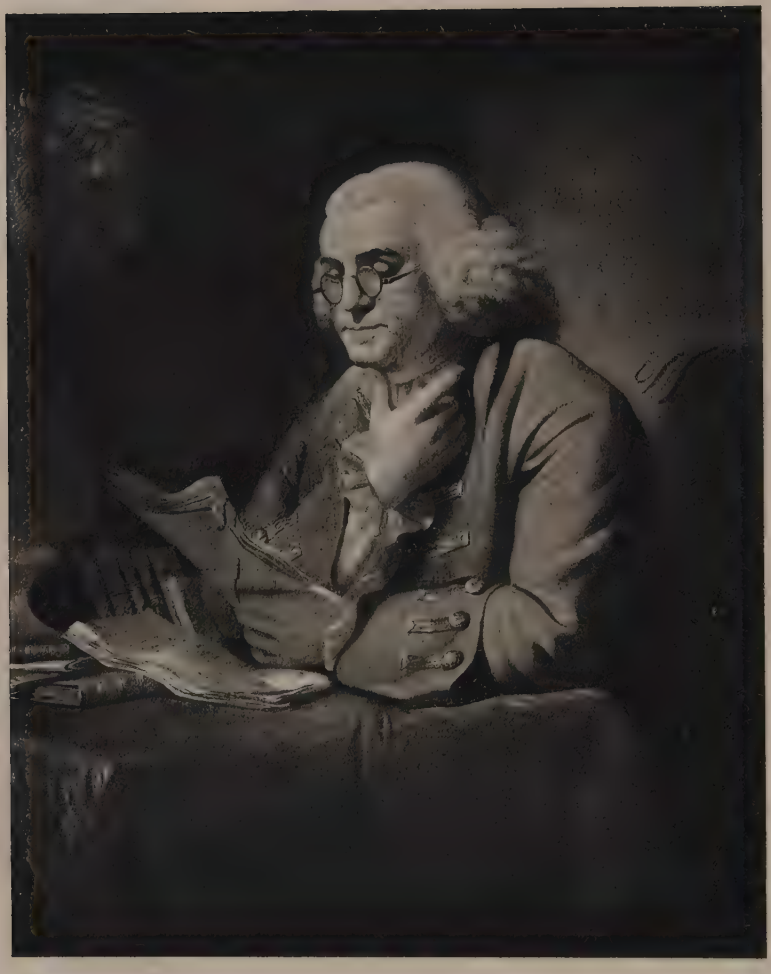
This faith in freedom was fully developed in Franklin long before the American Revolution and the French Revolution made the fundamental principles of liberty familiar to civilized mankind. His views concerning civil liberty were even more remarkable for his time than his views concerning religious liberty; but they were not developed in a passionate nature inspired by

an enthusiastic idealism. He was the very embodiment of common sense, moderation, and sober honesty. His standard of human society is perfectly expressed in the description of New England which he wrote in 1772. "I thought often of the happiness in New England, where every man is a freeholder, has a vote in public affairs, lives in a tidy. warm house, has plenty of good food and fuel, and whole clothes from head to foot, the manufacture perhaps of his own family. Long may they continue in this situation!" Such was Franklin's conception of a free and happy people. Such was his political philosophy.

The moral philosophy of Franklin consisted almost exclusively in the inculcation of certain very practical and unimaginative virtues, such as temperance, frugality, industry, moderation, cleanliness, and tranquility. Sincerity and justice, and resolution—that indispensable fly-wheel of virtuous habit—are found in his table of virtues; but all his moral precepts seem to be based on observation and experience of life, and to express his convictions concerning what is profitable, prudent, and on the whole satisfactory in the life that now is. His philosophy is a guide of life, because it searches out virtues and so provides the means of expelling vices. It may reasonably determine conduct. It did determine Franklin's conduct to a remarkable degree, and has had a prodigious influence for good on his countrymen and

on civilized mankind. Nevertheless, it omits all consideration of the prime motive power which must impel to right conduct, as fire supplies the power which actuates the engine. That motive power is pure, unselfish love,—love to God and love to man. "Thou shalt love the Lord thy God with all thy heart . . . and thy neighbor as thyself."

Franklin never seems to have perceived that the supreme tests of civilization are the tender and honorable treatment of women as equals, and the sanctity of home life. There was one primary virtue on his list which he did not always practice. His failure in this respect diminished his influence for good among his contemporaries, and must always qualify the admiration with which mankind will regard him as a moral philosopher and an exhorter to a good life. His sagacity, intellectual force, versatility, originality, firmness, fortunate period of service, and longevity combined to make him a great leader of his people. In American public affairs the generation of wise leaders next to his own felt for him high admiration and respect; and the strong Republic whose birth and youthful growth he witnessed will carry down his fame as political philosopher, patriot, and apostle of liberty through long generations.



BENJAMIN FRANKLIN

PAINTED BY DAVID MARTIN ABOUT 1766

FROM THE COPY BY CHARLES WILLSON PEALE IN THE POSSESSION OF THE AMERICAN PHILOSOPHICAL SOCIETY

FRANKLIN
AS STATESMAN AND DIPLOMATIST

By Joseph Hodges Choate, LL.D., D.C.L.

[Address delivered in The American Academy of Music, Friday, April 20]

TO attempt to portray Fraklin as statesman and diplomatist in forty minutes is like trying to write on the palm of your hand the history of the eighteenth century, of which he was so important a part. From the time when he began organizing the civic life of Philadelphia, and making it the model city of the continent, until sixty years afterwards, when upon his death bed and in immediate expectation of death, he signed the Memorial to Congress for the abolition of slavery, "that it would be pleased to countenance the restoration of liberty to those unhappy men who alone in this land of freedom are degraded into perpetual bondage, and who amidst the general joy of surrounding freedom are groaning in servile subjection," he was always the statesman, and generally quite in advance of his times. From 1757, when he visited London to test the question whether the State of Pennsylvania, with its two hundred thousand inhabitants, was the property of the descendants of William Penn, or belonged to its own citizens,

till 1785, when he arrived home from Paris, bringing his sheaves with him in the shape of one of the most important and beneficent treaties ever signed between nations, he was always the diplomatist, the foremost of his time, or, as I think, of any time. It is not in the nature of things to divide Franklin into three distinct sections or compartments, as our program of to-day invites us to do, and find in each a distinct being labelled "philanthropist," "philosopher" and "statesman," because he was everywhere and always the same Franklin, unique and indivisible, and the same qualities which made him great in the other relations of life, in which he has just been depicted, made him also the great statesman. It was that marvellous common sense in uncommon proportions, that powerful and active brain, capable almost from childhood of dealing with any subject, his tireless industry, self-denial, tact, thrift and good nature, and his unfailing interest in human affairs, his courage and wit and self-assertion that made this all-round man preeminently fit for any service, public or private.

He had one vast advantage over all the other chief founders of our republic, in his superior age and experience and public prestige. When Franklin had already snatched the lightning from the clouds, and taken his place among the most famous of the earth, Washington was still following the modest career of a surveyor in the Alleghany hills and valleys. John Adams was still

a school boy. Jefferson was just out of the nursery, and Hamilton was not to be born for ten years, and this long period of precedence he had spent in a way best suited to create the future statesman and diplomatist.

It has often been said that in the New England town meeting the secret of political science was solved, and the foundations of republican government were laid. If this was so in the abstract, what a concrete example of true training for public life was Franklin's experience here for the quarter of a century after his return home from that first hapless journey to London in 1826. He had a natural instinct for public life, quite as strong and controlling as marks the young men of the governing class in England, who are born and bred to it from generation to generation, and how different had been his training! For him, no university, no college, and only school enough for the simplest rudiments of learning. The tallow chandler's shop and the printing office and his own genius for self culture did the rest. It was his keen interest in human affairs, his concern for the welfare of the community in which he lived, and his natural ambition for leadership, that with him supplied the place of school and college and university.

When he walked up Market Street, with a roll under each arm and munching the third, Philadelphia, the modest Quaker village of seven thousand inhabitants, seemed as little likely to be a nursery of greatness, as

the runaway apprentice from Boston gave promise of being by and by the most eminent citizen of America.

You can actually trace the successive steps here in Philadelphia by which this green and awkward youth, after sowing his wild oats in London, advanced from obscurity to recognition, from recognition to influence, from influence to leadership, in this town which he had made his home. Diligence in his business was at the bottom of it all. "Seest thou a man diligent in his business, he shall stand before Kings," and he was proud to say in his old age that he had stood before five kings and sat with one of them; and then, constant study, reading and writing and thinking on every branch of knowledge in every hour that he could snatch from labor made him what he came to be.

The founding of the Junto for debate and self-improvement, composed of a dozen quick-witted, young working men of his own age, and its ramification into associated clubs; the purchase and editing of the Pennsylvania *Gazette,* and the establishment of *Poor Richard's Almanac,* into both of which he threw the whole weight of his rich and charming personality, making the one the best newspaper in the colonies and the other a familiar and welcome guest in nearly every household in the land, and both his personal organs, when no one else had an organ, through the whole period of his growth to greatness; his original conception of the library which

has been such a vast benefit to Philadelphia, and the mother and model of many similar libraries througout the land; the printing and publishing of many valuable works, of all of which we may be sure he mastered the contents, in that hour or two of every day stolen for study,—during which he also learned French, Italian and Spanish; his constant and increasing correspondence with men of light and learning everywhere; the founding of this The American Philosophical Society; his achievements in electricity; the founding of the school that grew to be the University of Pennsylvania; his hearty support of the project for the Pennsylvania Hospital; the paving and lighting of the city, and his efforts to place the Province in a condition to defend itself; his service as a member of the City Council and as alderman, as clerk and member of the Assembly and as Public Printer, and finally his service as postmaster of Philadelphia and Deputy Postmaster-General of all the colonies and his long controversy and struggle with the proprietors,—these were the steady and gradual marches by which, by the middle of the eighteenth century, he had grown to be not only the best known man in America, but the best qualified for every form of public service. In him were concentrated all the best forms of practical politics. He was never anything if not practical.

And now thus splendidly qualified and equipped for

great affairs, in the very prime of life, known and honored by all men in all civilized lands, he was to enter upon forty years of continuous public service of the highest character and dignity.

It is the ordinary fate of public men to leave no indelible marks of their service to impress their memory upon future generations. Most of them make a great impression upon their own time by their speeches. But the published speeches of even great orators fill the shelves of public libraries, unread and unopened, when their contemporaries have passed away. I know of but two in the English language, one upon either side of the water—Burke and Webster—who continue to be generally read and studied by later generations. And Franklin made no speeches. Like Washington, he is said never to have spoken more than fifteen minutes at a time on any subject.

It was his peculiar felicity to have been concerned in great actions, which speak, even to posterity, so much louder than words, and which preserve to remote ages the memory of the chief actors in them. To have stood as the responsible representative of America for fifteen years in England and for ten years in France, in periods most critical for those countries and his own, and so to have lived history at its best and most interesting points of time; to have been the author of the first plan of Union of the American colonies, which was the germ

of the final plan; to have signed and helped to frame the Declaration of Independence, the Treaty of Alliance, the Treaty of Commerce, the Treaty of Peace, and the Constitution of the United States—these great acts are sufficient to place him in the front rank of our constructive statesmen and designate him as the greatest of our diplomatists from the beginning until now.

It is the fate of the average ambassador or minister to foreign countries to become generally subject to the influence of his new surroundings, and to look sometimes through foreign spectacles at public and social questions, and unduly to admire the rulers and institutions of the nations which welcome them so warmly and honor them so highly. But it was the unique merit of Franklin to be so intensely American that no foreign influence could touch him. Jefferson argued that it spoilt an American diplomatist to keep him abroad seven years—and I think many instances could be cited in support of his argument. But Jefferson took care to add that this did not apply to Franklin, who, he says, was America itself when in France, not subjecting himself to French influence, but subjecting France to American influence, and I am sure that this is true of him in his fifteen years in England.

The American ambassador of to-day can hardly realize the responsibility, difficulty and danger that surrounded his predecessor of the eighteenth century. Tied

fast to the electric cable, he receives his instructions daily and even hourly, and has but to repeat them by rote to the foreign office of the government, to which he is accredited, with no discretion to withhold or to modify. He is seldom consulted as to the formation of the policy of his government which he is to enforce and maintain abroad, and until the wise reform recently inaugurated by Secretary Root, he has seldom been kept constantly informed of what was passing at home between his own chief and the ambassador here of the nation at whose Court he resides—even upon matters with which he himself had to do—so potent is the cable as the medium and instrument of complete control the world over.

But it was not so in Franklin's time, and the difficulties and perils that beset his path at every step were without number. There was no Secretary of State until October, 1781, nearly three years after the Treaty of Alliance with France had been signed, when Robert R. Livingston, who had been elected to the office, was able to enter upon its duties. But under the Confederation even the Secretary of State was not his own master. So jealous was the Congress of any executive power that he was obliged, as a practice, to send out no papers of importance without first submitting them to Congress and also to submit to Congress all despatches and communications from abroad with his drafts of replies. "Singularly able and accomplished as Livingston was," says Whar-

ton, " he never was intrusted with those initiative diplomatic powers which in England and now under the Constitution of the United States, are confided to the department having charge of foreign affairs. Congress continued to pass resolutions directing the policy foreign ministers were to pursue." So that it was to the resolutions of a vacillating Congress, and when Congress was not in session, to letters from a constantly shifting Commitee of Congress that Franklin had to look for general or specific instructions. As letters then, under the best circumstances, averaged two months in their passage from Philadelphia to Paris; and after the war between France and England began he was sometimes six months, and at one time eleven months, without advice from his government, he had to act upon his own responsibility and at his own peril in matters of the greatest concern; and so the greater the responsibility, the greater the credit for all his diplomatic achievements.

In another respect, Franklin had a substantial advantage as our representative in Paris. The Congress of the Confederation seems to have laid down the proper rule as to what was necessary to maintain the dignity of their diplomatic representatives abroad. When he was first appointed one of the Commissioners to Paris the salary of the Commissioners was not fixed at a specific sum, Congress resolving " that they shall live in such a style and manner as they might find suitable and

necessary to support the dignity of their public character, and that besides the actual expenses of the Commissioners a handsome allowance should be made to each of them as a compensation for their trouble, risk and services." By singular good fortune, which seemed always to attend him, Franklin was able to obey this injunction of Congress, and to secure for himself and his embassy an establishment in the suburbs of Paris which served in a most perfect way as a dignified and suitable residence, where he continued to live during the whole of his nine years in France in a manner becoming the representative of his country abroad.

The quarter of Passy, where Franklin's abode was situated, was then one of the most attractive in the environs of the capital, and was happily the property of M. de Chaumont, a great friend of the American cause, whom Franklin in a letter to Washington describes as " the first in France who gave us credit and, before the Court showed us any countenance, trusted us with two thousand barrels of gunpowder, and from time to time afterwards exerted himself to furnish the Congress with supplies of various kinds." De Chaumont, who, as Wharton infers, upon some understanding with the French government, freely offered this handsome mansion on grounds on which he himself resided for Franklin's occupation, was a gentleman of fortune and distinction. He had been one of the Council of Louis XV and then held an im-

portant office under his successor, and was thus in close touch with the ministry, while also constantly in intimate contact with Franklin; and, as the interest of the French government in our affairs increased, there is good reason to believe that he was an active medium through whom confidential relations were maintained before and after the official recognition of the American Commissioners between them and the ministry without exciting the curiosity of the outside world. Mr. Bigelow truly says that "his timely and judicious hospitality has associated his name only less prominently than Franklin's with the fortunes of the great American republic," and that the people of the United States should hold him in grateful and honored remembrance.

It is impossible to state the value of Franklin's public services. They are simply inestimable.

The scheme of union which the Congress of the seven northern colonies adopted in 1754 was Franklin's scheme. It contained some of the germs which afterwards took root in the Constitution of the United States. It aimed at the formation of a self-sustaining Federal government with authority as obligatory in its sphere as the local governments were in their spheres. The home government rejected it as too democratic, and the colonies as granting too much to prerogative, a test of its real moderation, which was generally characteristic of all that he ever proposed. The colonies were not yet ripe for

union—and Franklin in proposing it was twenty years in advance of his age.

Three years afterwards, when the fierce disputes between the colonial governor and the Province of Pennsylvania over the claims of the proprietaries that their vast estates should be exempt from taxation and its whole burden thrown upon the rest of the people whose united wealth scarcely equalled theirs, seemed hopeless of solution, Franklin, who had long borne a conspicuous part in the quarrel on the side of the colony, was sent to England to maintain the popular cause. It proved to be a more difficult undertaking than even he had anticipated, involved negotiations which extended over a period of five years, and ended in a compromise proposed by him, which was a substantial triumph for his people.

This first protracted stay of Franklin in England was probably the happiest of his life. Times had changed since his first visit thirty years before when, as a journeyman printer, he had lived in Little Britain on three and six pence a week and thought himself lucky to get that. All doors were thrown open to him, and he was welcomed by all classes as one of the master spirits of the age. He reveled in the meetings of the Royal Society and enjoyed the personal acquaintance of many of England's greatest men, such as Priestley, Fothergill, Garrick, Lord Shelbourne, Lord Stanhope, Edmund Burke,

Adam Smith and David Hume, Dr. Robertson, Lord Kames and David Hartley and the "Good Bishop" of St. Asaph's, Dr. Shipley. He witnessed the coronation of George Third. But Pitt, who had vastly weightier things on his mind than Franklin's errand,—Pitt, who afterwards as Lord Chatham proved to be one of his most stalwart and devoted admirers and champions, he found wholly inaccessible. He found leisure to visit France, Scotland and Holland, and to make himself master of European politics—and did much pamphleteering in behalf of British interests—for at that time, like all his countrymen, he was a most loyal and devoted British subject and gloried in the prospects of the future greatness of the British Empire. When Pratt, afterwards Lord Camden, told him that in spite of their boasted loyalty, the Americans would one day set up for independence, he answered that no such idea was ever entertained by the Americans, nor will any such ever enter their heads unless you grossly abuse them. "Very true," replied Pratt, "that is one of the main causes I see will happen, and will produce the event." As Parton truly says of him at this time, "It was one of Franklin's most cherished opinions that the greatness of England and the happiness of America depended chiefly upon their being cordially united. The country which Franklin loved was not England nor America, but the great and glorious Empire which these two united to

form." He was a true imperialist in the broadest sense of the term and dreamed of the future prowess of the English race united all around the globe; and nobody would have rejoiced more proudly than he, if he could have looked across the gulf of time to our day to see that race, divided into two great branches, but united more truly and securely than in his day, standing together with double power, with the common object of promoting liberty and order and peace, not only in their own dominions but the world over, which to him was always an object so dear.

Why need I dwell on the details of Franklin's subsequent political career, which have been made so familiar to everybody in connection with the celebration of the two hundredth anniversary of his birth?

When he went again to England in 1764, in the vain hope of preventing the passage of the Stamp Act, he little dreamed that he would be detained there ten years in the brave and constant struggle to maintain the rights of the colonists, to keep the peace between them and the mother country, and to preserve unbroken the union of the race on which he had set his heart; that in the course of this struggle he would incur by turns the hostility and condemnation of both branches of the Empire, and that it would end at last in the temporary defeat of all his hopes and aspirations.

He arrived too late to prevent the enactment of that

disastrous measure, but not too late to secure its immediate repeal. The two most remarkable events which mark this, his last visit to England, occurred, one at its beginning in 1765, and the other at its close in 1774, his examination before the House of Commons and his hearing before the Privy Council in the Cockpit where he stood as a mute witness, yes, a martyr, to the wrongs of his countrymen, and vials of wrath were poured upon his devoted head.

Each of these notable occasions exhibits him to the best advantage as a statesman, and displays most signally the courage, the manliness and the simplicity of his character.

On his examination before the House of Commons, with absolute calmness and serenity, with a mastery of his subject more complete than any other man on either side of the water could have had, with a simplicity of speech and honesty of conviction all his own, he demonstrated to his reluctant audience the bitter injustice and inexpediency of the fatal enactment. I know of no other piece of testimony in the English language so remarkable, and some of his answers can never be forgotten. So convincing and irresistible was his evidence that the repeal of the Stamp Act followed immediately. His testimony before the Committee was closed on the thirteenth day of February. On the twenty-first General Conway moved for leave to introduce in the House

of Commons a Bill to Repeal, which was carried. The Bill took its third reading in that House on the fifth of March. It passed the House of Lords on the seventeenth and on the eighteenth, five weeks after Franklin had been heard, the King signed the Bill. Franklin celebrated the happy event in his own simple and characteristic way by sending his wife a new gown, and wrote her, "As the Stamp Act is at length repealed, I am willing you should have a new gown, which you may suppose I did not send sooner, as I knew you would not like to be finer than your neighbors unless in a gown of your own spinning."

In the ten years that followed he labored incessantly and ardently to maintain the cause of union; he exercised a powerful influence on the great men of the nation, which was afterwards reflected in the speeches and conduct of such noble advocates of the American cause as Burke and Chatham and Fox and Conway, in whose favor history has happily reversed contemporary opinion, and brought all Englishmen to accept their veiws.

But labor as he would and hope as he did, it became impossible at last to stem the tide of discord that was sweeping both nations into the irrepressible and inevitable conflict, which was to separate them for the time being, only to bring them after the lapse of four generations into newer and better harmony and union.

As the prolonged contest waxed hotter and fiercer,

while Parliament was passing its obnoxious measures, and Boston harbor was a cauldron of cold tea unhappily taxed, Franklin, as the recognized representative of all the colonies, became the very storm center round which all the elements of discord and growing hatred gathered in full force, and was often the target for both sides to attack. In England the ministry regarded him as too much of an American, and the most ardent patriots at home denounced him as too much of an Englishman, another signal proof of his characteristic justice and moderation.

At last the tempest burst in all its fury upon his devoted head, and I regard that cruel hour in the Cockpit in January, 1774, as the grandest and most heroic of his whole public life. Scenes of great triumph and glory were in store for him in the future, but that day of suffering and humiliation for the imputed faults of all his countrymen surpassed them all in grandeur. His absolute self-command and unruffled dignity as he stood there to receive, amid the jeers of the Privy Council, that pitiless storm of calumny and abuse,—an attack universally condemned to-day, alike in England and America, —is conclusive evidence of his heroism, of his conscious innocence, and of the purity and nobility of his character. Let me repeat here a word which I spoke of him in England, and which seemed to receive the approval of a generous people: "Upon the canvas of history he

stands out from that ignoble scene an heroic figure, bearing silent testimony to the cause of the colonists for whose sake he suffered—not a muscle moved, not a heart beat quickened—and casting into the shade of lasting oblivion all those who joined in the assault upon him."

He said next day to Dr. Priestley that "he had never before been so sensible of the power of a good conscience; for that, if he had not considered the thing for which he had been so much insulted as one of the best actions of his life, and what he should do again in the same circumstances, he could not have supported it."

No doubt this cruel event, which at once became the talk of the town and country, did seriously impair his popularity and prestige during the rest of his stay in London, which continued for another year, and which he steadily devoted to the hopeless cause of conciliation. But it did not cost him a single one of his great and true friends, and Lord Chatham spoke and acted for them all shortly afterwards when, on the occasion of a great debate in the House of Lords on American affairs, he invited him to attend in the House, "being sure that his presence in that day's debate would be of more service to America than his own," and later, in answer to a fling at Franklin by another noble lord, declared, "that if he were first minister of this country, and had the care of settling this momentous business, he should not be ashamed of calling to his assistance a person so perfectly

acquainted with American affairs as the gentleman alluded to and so injuriously reflected on; one whom all Europe held in high estimation for his knowledge and wisdom, and ranked with our Boyles and Newtons; who was an honor, not to the English nation only, but to human nature."

How fortunate Franklin was in the accidents of his life, as well as in his marvellous gifts and happy temperament! Scarcely had he landed on his return from England, which he was never again to revisit, when the proud and grateful people of Pennsylvania made him one of their delegates to the Second Congress, to meet next day in Philadelphia. It was just three weeks after Lexington, where the colonists had unsheathed the sword and thrown away the scabbard—and from that day Franklin was as steadfast a champion of independence as he had before been of conciliation. He had the good fortune to join in the election of Washington as commander-in-chief, between whom and himself from the time of Braddock's defeat, twenty-one years before, and his own death, fifteen years afterwards, the closest friendship and mutual confidence prevailed; and then he had the great honor to be one of the Committee of Five elected by ballot to draft the Declaration of Independence. Let no man detract by a word from the glory of Jefferson in being the sole author of that immortal instrument. The amendments made by Franklin and

Adams were only verbal, but there can be no doubt that their fame and weight of character added to its dignity and general acceptance. And who will deny the happy merit of Franklin's share in the signing, when he anticipated Lincoln's faculty of relieving the most solemn and critical moments by a timely jest, and when Hancock, taking up the pen to sign first, declared, "We must be unanimous; there must be no pulling different ways; we must all hang together," Franklin made the reply which will live in history as one of its happiest jests: "Yes, we must all hang together, or assuredly we shall all hang separately," which did in felicitous phrase express the sober truth at that critical hour.

But it was one thing to declare our independence and quite another to make that declaration good, and unless we could obtain foreign aid and alliance, the cause of the revolted colonies was desperate indeed. Franklin was the one man in all the world who could accomplish this, if indeed it were possible at all, and I need not tell you how perfectly, against what fearful odds, under what mighty difficulties, he did accomplish it. Without Saratoga we should not have had the Alliance. Without Yorktown we should have waited long for the Treaty of Peace, but without Franklin, and Franklin in Paris, those great treaties would have been far less effective and full of benefit to America and to mankind than they were.

Although past seventy and already beginning to feel the weight of years and infirmities when he accepted the invitation of Congress as an irresistible command to go to Paris on his glorious mission, his labors in the next nine years were prodigious, the difficulties which he encountered and sacrifices to which he submitted, were almost incredible; and his amazing success still remains one of the wonders of history.

France was already crippled in her finances, wholly unable to afford the liberal aid which, with generous sympathy, she lavished upon us, in response to his urgent and tactful appeals, and was already suffering under those heavy burdens and evil domestic conditions, which before the close of the century brought her to the verge of ruin, and sure to be forced into a wasting war if she really came effectively to our rescue. But the enthusiastic order of her mercurial people for the cause of liberty enabled Franklin to overcome all obstacles, and to win her to our sorely needed support.

His world-wide fame and familiar personality had paved the way for his reception. His arrival was the signal for a tremendous outburst of popular enthusiasm, that met with a hearty response throughout Europe, which included the fashionable world and the philosophers and scholars and statesmen as well as the populace.

" His virtues, and his renown," says Lacretelle, " negotiated for him, and before the second year of his mission

had expired, no one conceived it possible to refuse fleets and armies to the countrymen of Franklin."

The German, Schlosser, says:

"Franklin's appearance in the Paris salons, even before he began to negotiate, was an event of great importance to the whole of Europe. Paris at that time set the fashion for the civilized world, and the admiration of Franklin, carried to a degree approaching folly, produced a remarkable effect on the fashionable circles of Paris. His dress, the simplicity of his personal appearance, the friendly meekness of the old man, and the apparent humility of the Quaker procured for freedom a mass of votaries among the Court circles."

But all this incense never turned his head, which was always clear and level for the important business which he had in hand and of which he never lost sight. In view of the constant obstacles which prevented and hindered his communication with Congress, he was in his own person the American government in Europe, and obliged to act not merely as an Ambassador, but as a War Department, a Treasury Department, a Navy Department, a Prize Court, a Bureau for the Relief and Exchange of Prisoners, a Consul, and a dealer in cargoes which came from America. He procured large and increasing loans from the almost exhausted treasury of France, and when, at last, peace became possible, he took an active and the leading part in the negotiation of the

Peace Treaty, which recognized forever the independence of his country and secured for the time being the peace of the three great nations concerned and of the world at large. The Treaty of Alliance was all his own, but in the Treaty of Peace he had the great advantage of the coöperation of John Adams and John Jay, and America will never cease to be grateful for the combined labors and wisdom of these great patriots, who thus brought about the consummation of our liberties, and to France, without whose triumphant assistance that consummation might have been postponed for half a century.

It would take many volumes to describe the activity, the brilliancy and success of Franklin's career in France. Here he displayed on the highest plane they have ever reached the best qualities of American statesmanship and diplomacy. His great brain, always at work on themes that concerned the welfare of his country and his fellow men; his capacious heart, which made him so human and so interesting to all mankind; his untiring industry and never-failing tact; his genial wit and the sunshine of his spirit; his absolute truthfulness which led him to say always what he meant and to mean what he said; his hope that never failed; his contempt of the mere forms and husks of diplomatic intercourse, going always straight to the point and sticking to it; his self-taught literary faculty and charming style; and his universal knowledge

of the world of human affairs, have made him at once the model and the despair of all later diplomatists.

And, finally, how transcendently fortunate were his last years! Returning at last, honored of all men, to his dear old home in Philadelphia, broken in health by the exhaustive labors of his eighth decade, but yet with strength and courage sufficient to serve his fellow citizens of Pennsylvania as their president and, already in his ninth decade, to take an active part in the Convention that formed the Constitution of the United States, sitting five hours a day there for four summer months, taking a potential part in their debates, too weak and ill to stand and deliver his speeches but writing them out carefully for others to read for him, and contributing the ripe fruits of his wisdom and patriotism to the great result.

When that great compact of compromises and concessions was finished, it suited no member of the Convention exactly, so much had each yielded of his own opinions to meet the views of the rest. But Franklin, the father of them all, led the way in insisting upon the unanimous and unconditional signature of all the delegates to the matchless instrument of government.

" I consent, sir," he said, " to this Constitution because I expect no better, and because I am not sure that it is not the best. The opinions I have had of its errors I sacrifice to the public good. I have never whispered a

syllable of them abroad. Within these walls they were born and here they shall die."

So long as this sublime spirit of patriotism and mutual concession shall govern the counsels and conduct of our rulers and statesmen, that sun which he saw behind the chair of Washington in Independence Hall, as they stood before him signing our Magna Charta, and which Franklin declared then and there to be the rising sun, will continue in its ascendent course. But when this spirit decays the sun of America will begin to set.

MEDAL STRVCK BY THE CONGRESS OF THE VNITED STATES
TO COMMEMORATE THE 200TH ANNIVERSARY OF THE BIRTH OF
BENJAMIN FRANKLIN.

PRESENTATION TO FRANCE OF THE GOLD MEDAL AUTHORIZED BY THE CONGRESS OF THE UNITED STATES, APRIL 27, 1904

By the Honorable Elihu Root,
Secretary of State

[In The American Academy of Music, Friday, April 20]

Excellency: On the 27th of April, 1904, the Congress of the United States provided by statute that the Secretary of State should cause to be struck a medal to commemorate the two hundredth anniversary of the birth of Benjamin Franklin, and that one single impression on gold should be presented, under the direction of the President of the United States, to the Republic of France.

Under the direction of the President I now execute this law by delivering the medal to you as the representative of the Republic of France. This medal is the work of fraternal collaboration by two artists whose citizenship Americans prize highly, Louis and Augustus Saint-Gaudens. The name indicates that they may have inherited some of the fine artistic sense which makes France preeminent in the exquisite art of the medalist.

On one side of the medal you will find the wise, benign, and spirited face of Franklin. On the other

side literature, science, and philosophy attend, while history makes her record. The material of the medal is American gold, as was Franklin.

For itself this would be but a small dividend upon the investments which the ardent Beaumarchais made for the mythical firm of Hortalez & Company. It would be but scanty interest on the never-ending loans yielded by the steady friendship of de Vergennes to the distressed appeals of Franklin. It is not appreciable even as a gift when one recalls what La Fayette, Rochambeau, de Grasse and their gallant comrades, were to us, and what they did for us; when one sees in historical perspective, the great share of France in securing American independence, looming always larger from our own point of view, in comparison with what we did for ourselves.

But take it for your country as a token that with all the changing manners of the passing years, with all the vast and welcome influx of new citizens from all the countries of the earth, Americans have not forgotten their fathers and their fathers' friends.

Know by it that we have in America a sentiment for France; and a sentiment, enduring among a people, is a great and substantial fact to be reckoned with.

We feel a little closer to you of France because of what you were to Franklin. Before the resplendence

and charm of your country's history—when all the world does homage to your literature, your art, your exact science, your philosophic thought—we smile with pleasure, for we feel, if we do not say: "Yes, these are old friends of ours; they were very fond of our Ben Franklin and he of them."

Made more appreciative, perhaps, by what France did for us when this old philosopher came to you, a stranger, bearing the burdens of our early poverty and distress, we feel that the enormous value of France to civilization should lead every lover of mankind, in whatever land, earnestly to desire the peace, the prosperity, the permanence, and the unchecked development, of your national life.

We, at least, can not feel otherwise; for what you were to Franklin, we would be—we are—to you: always true and loyal friends.

RECEPTION OF THE FRANKLIN MEDAL

BY HIS EXCELLENCY, M. J. J. JUSSERAND, *The French Ambassador*

On behalf of the French Republic, with feelings of deepest gratitude, I receive the gift offered to my country, this masterful portrait of Franklin, which a law of Congress ordered to be made and which is signed with the name, twice famous, of Saint-Gaudens.

Everything in such a present powerfully appeals to a French mind. It represents a man ever venerated and admired in my country—the scientist, the philosopher, the inventor, the leader of men, the one who gave to France her first notion of what true Americans really were. "When you were in France," the Marquis de Chastellux wrote later to Franklin, "there was no need to praise the Americans. We had only to say: Look; here is their representative."

The gift is offered in this town of Philadelphia where there exists a hall the very name of which is especially dear to every American and every French heart—the Hall of Independence—and at a gathering of a society founded "for promoting useful knowledge," which has remained true to its principle, worthy of its founder, and which numbers many whose fame is equally great on both sides of the ocean.

I receive it at the hands of one of the best servants of the State which this great country ever produced, no less admired at the head of her diplomacy now than he was lately at the head of her Army, one of those rare men who prove the right man, whatever be the place. You have listened to his words, and you will agree with me when I say that I shall have two golden gifts to forward to my Government: the medal and Secretary Root's speech.

The work of art offered by America to France will be sent to Paris to be harbored in that unique museum, our Museum of Medals, where French history is, so to say, written in gold and bronze, from the fifteenth century up to now, without any ruler, any great event, being omitted. Some of the American past is also written there: that period so glorious when the histories of France and America were the same history, when first rose a nation that has never since ceased to rise.

There, awaiting your gift, are preserved medals struck in France at the very time of the events, in honor of Washington, to commemorate the relief of Boston in 1776; a medal to John Paul Jones in honor of his naval campaign of 1779; another medal representing Washington, and one representing General Howard, to commemorate the battle of Cowpens in 1781; one to celebrate the peace of 1783 and the freedom of the thirteen States; one of La Fayette; one of Suffren, who fought so valiantly on distant seas for the same cause as Washington; one, lastly, of Franklin himself, dated 1784, bearing the famous inscription composed in honor of the great man by Turgot: "Eripuit cœlo fulmen, sceptrumque tyrannis."

My earnest hope is that one of the next medals to be struck and added to the series will be one to commemorate the resurrection of that great town which now, at

this present hour, agonizes by the shores of the Pacific. The disaster of San Francisco has awakened a feeling of deepest grief in every French heart, and a feeling of admiration, too, for the manliness displayed by the population during this awful trial. So that what will be commemorated will not be only the American nation's sorrow, but her unfailing heroism and energy.

Now your magnificent gift will be added to the collection in Paris; it will be there in its proper place. The thousands who visit that Museum will be reminded by it that the ties happily formed long ago are neither broken nor distended, and they will contemplate with a veneration equal to that of their ancestors the features of one whom Mirabeau justly called one of the heroes of mankind.

FRANKLIN'S RESEARCHES IN ELECTRICITY

By Professor Edward L. Nichols

[Address delivered in Witherspoon Hall, Wednesday, April 18.]

TO estimate justly the achievements of Benjamin Franklin in electricity it is necessary to consider briefly the state of that science at the time when he began his experiments. It was known at a very early day that certain substances such as amber when rubbed acquire the power of attracting light bodies, but no considerable advance beyond the observations recorded by Thales 600 B. C. and Theophrastus 300 B. C. appears to have been made up to the time when Gilbert began his work upon this subject about 1600. Gilbert greatly extended the list of bodies electrified by friction. He found various precious stones and many other substances such as sulphur, resin, and glass to possess this property.

Towards the end of the seventeenth century Boyle added something to Gilbert's observations. He discovered that the attraction between electrical bodies occurred in vacuo as well as through air at ordinary pressures, and that an electrified body was attracted by as well as being capable of attracting other bodies. He also studied what we now call the tribo-luminescence of

diamonds, a phenomenon which he supposed to be connected in some way with electrification. Wall,[1] about 1670, observed the sparks from amber when rubbed with wool and, what is remarkable, compared the noise and light produced to that of thunder and lightning. Newton[2] also paid some attention to electrical phenomena, and he was perhaps the first to observe electrostatic attraction through a solid dielectric. In his "Optics" he put forth the hypothesis of an elastic fluid emitted by electrified bodies and capable of penetrating solids such as glass.

The most notable electrical discoveries of the seventeenth century were, however, due to Otto von Guericke, the inventor of the air pump, whose experiments extended from 1670 to 1700. He made an electrical machine consisting of a globe of sulphur mounted on an axle and rubbed with the hand. He discovered the repulsion between charged bodies and found that bodies could be electrified without contact by bringing them into the field of a body previously charged. He described the sound of the electric discharge and compared the spark to the light emitted by sugar when pounded in the dark.[3] The close of the seventeenth century is likewise notable as the period during which the members

[1] Wall: Phil. Trans. 1670.

[2] Newton: Phil. Trans. 1675.

[3] Priestley: History of Electricity, Vol. I, Page 11.

of the Italian Academy "del Cimento" began their studies of electricity. Among other things they observed the discharging power of flames afterwards rediscovered by Franklin.

The earliest investigations of the eighteenth century were those of Hauksbee who studied the electric glow in vacuo over mercury, a phenomenon first observed by Picard in 1670, and noted the great difference between the discharge in vacuo and that occurring at ordinary pressures. Hauksbee made a machine having a revolving globe of glass rubbed with the hand.

After Hauksbee there was a lull in electrical interest which lasted for a quarter of a century. Then came the period of intense activity which culminated in Franklin's work. The revival appears to have had its origin in England about 1728, at which time Stephen Grey of London began a remarkable series of experiments in association with a friend, the Rev. Mr. Wheeler. They found that such substances as hair, silk, linen, wool, paper and leather could be electrified by friction and discovered in 1729 the conduction of the charge from an electrified body to neighboring bodies. In attempting to transmit the electrification along a linen thread they found it necessary to insulate the line by means of silk cords, and were thus led to a recognition of the distinction between conductors and non-conductors. They succeeded ultimately in transmitting the electric charge

over a line of pack thread to a distance of 765 feet, and having thus learned how to conduct the effect to a distance they experimented upon the electrification of all sorts of bodies, such as a load-stone, a red-hot poker, a chicken, a soap bubble, a boy, suspended from the end of their line. They also compared in a rough way the electrification of a solid with that of a hollow body of same material and found them as nearly as they could judge to be alike. In 1734 Grey and Wheeler, working in a dark room, observed the brush discharge from a suspended metal rod which had been electrified, and made some observations upon the electric discharge. Speaking of electricity that year, Grey says: "It seems to be of the same nature as thunder and lightning."

In 1733 Charles Francis DuFay, a retired army officer, and member of the Paris Academy, took up the study of electricity. He repeated many of the experiments of Grey and others, discovered the use of glass as an insulator for his lines and found that the thread conducted better when wet. DuFay announced the discovery of two kinds of electricity, vitreous and resinous, and the law of the repulsion of like and the attraction of unlike charges. He was assisted in his experiments by the Abbé Nollet, who became subsequently one of the most prolific writers of the time upon the subject of electricity.

About 1740 electricity began to receive serious attention in Germany, where the frictional machine of Hauksbee was revived by Professors Hausen and Winkler of Leipzig. Winkler is said to have first substituted a rubbing pad or cushion for the hand. Gordon of Erfurt introduced the use of a cylinder instead of the glass globe. Boze of Wittenberg further perfected the electrical machine by the addition of a conductor of metal insulated by silk threads.

These improvements in electrical apparatus made it possible to generate charges of much greater quantity than before and to perform many new and surprising experiments, such as the ignition of volatile substances and the killing of small animals by means of the spark, the bleaching of colors, the ringing of bells and the production of various mechanical motions. Brilliant discharges in vacuum tubes were produced by Grummert, who even proposed to make use of this form of light in mines. These demonstrations soon began to attract not only scientific men but the general public. Prizes were offered by the various learned societies and public exhibitions were given.

In 1745 the so-called Leyden jar was discovered by von Kleist,[1] dean of the cathedral in Camin and a few months later, independently, by Cuneus of Leyden. The

[1] Hoppe: Geschichte der Elektricität, p. 18.

extraordinary effects obtained with this simple device were of a character to further appeal to the imagination and to intensify public interest in electricity. Experimentation became the popular fad of the time; the electrical machine and its accessories were regarded as a necessary part of the equipment of people of fashion. Electricity became for the time being the amusement of the leisure class as well as the subject of study for savants. The feature which especially excited interest was doubtless the violence of the shock felt by a person through whose body the discharge of a Leyden jar took place and the fact that the effect could be imparted to a number of individuals simultaneously. The Abbé Nollet demonstrated this fact by two famous experiments. In the first instance he imparted the shock of a Leyden jar to 180 of the King's guards for the edification of Louis XV and subsequently to the monks of the Carthusian monastery in Paris; for which purpose all the members of that great establishment formed a line nine hundred toises, or about an English mile, in length.

The effect upon the public mind of the discovery of the Leyden jar may be compared with that produced in our own time by the announcement of the X-rays, of liquid air, or of radium; but the interest excited was much more general and more intense and, owing to the simple nature of the apparatus necessary for repeating

the experiments, a relatively larger number of would-be investigators took the subject up. Discoveries were announced from day to day, and all sorts of theories, many of them more or less obscure, were promulgated.

The excitement over electricity appears to have reached the American colonies in the spring of 1747. Benjamin Franklin, in the first of the famous series of letters in which his experiments on electricity are described, writes to Peter Collinson, Esq., of London as follows:

"PHILADELPHIA, March 28, 1747.

"*Sir*:—Your kind present of an electric tube with directions for using it has put several of us on making electrical experiments in which we have observed some particular phenomena that we look upon to be new. I shall therefore communicate them to you in my next, though possibly they may not be new to you, as among the numbers daily employed in those experiments on your side of the water, 'tis probable some one or other has hit on the same observations. For my own part I never was before engaged in any study that so totally engrossed my attention and my time as this has lately done; for what with making experiments when I can be alone, and repeating them to my friends and acquaintances, who, from the novelty of the thing, come continually in crowds to see them, I have, during some months past, had little leisure for anything else. I am, etc.

"B. FRANKLIN."

Such was the introduction of our illustrious countryman to the science of electricity. Franklin was at this time forty years of age, a prosperous citizen of Philadelphia, self-educated and self-made. Like many of his contemporaries similarly situated in Europe, he took up the subject as an amusement or hobby. Unlike them, however, he labored under the disadvantage of residence in a remote colonial community. He was of necessity imperfectly acquainted with previous work in electricity and was compelled to rediscover for himself many of the things which had already been observed in Europe.

That under these circumstances Franklin should have become the foremost electrician of his time, and that the series of letters in which he communicated his observations and theories should have been received with acclamation on the other side of the water and should have been translated into all the principal languages of Europe is the more remarkable. The extraordinary success of his book with the greater public in Europe is doubtless due in great part to its admirable literary qualities. The epigrammatic terseness, the clearness and simplicity of style, the naive frankness and inimitable humor which have earned for Franklin an imperishable place in literature characterize these pages and give them life. Even now, after a century and a half, although he can tell us little about electricity that is not familiar, we read his pages with pleasure and derive from them

the satisfaction which comes only from the contemplation of a masterpiece.

Although Franklin was without scientific training in the modern sense, it was his life-long habit to observe the phenomena of nature and to reason about them. His native ability was so unusual as to compensate for his lack of an academic education and to fit him in rare degree for scientific pursuits.

Franklin's earliest achievement in electricity was his discovery of the power of a pointed conductor to discharge an electrified body when brought near the same, and to prevent the accumulation of charge upon a conductor to which it was attached. Of this property he later made application in the lightning rod. During the summer of 1847 he performed a series of experiments with the Leyden jar which were described with admirable brevity and lucidity in his third letter to Peter Collinson, dated September first of that year. Nothing could serve better to demonstrate the qualities of Franklin as a man of science than this little investigation which occupied but a few weeks. The eleven experiments, to each of which a single brief paragraph is given, cover the essential phenomena of the condenser. As statements of fact they will stand almost without revision or amendment at the present day.

Upon this device "M. Muschenbroek's wonderful bottle," as Franklin called it in his third letter,—of the

earlier experiments of von Kleist, Gralath and Winkler, he appears to have had no knowledge—the scientific attention of all Europe had been focused for more than a year, but it remained for Franklin to demonstrate explicitly that the inside and outside of a jar are oppositely charged and that the charges reside in the dielectric and not in the coatings. He also showed that a jar cannot be discharged by contact with either coating separately, but only by providing a conducting circuit between them; that a jar cannot be charged without grounding one coating or in some way removing from one coating a charge equal but opposite in sign to that introduced into the other, and that a jar may be charged by the outer coating provided the inner meantime be grounded.

He devised the cascade arrangement by which a number of jars can be charged or discharged in series and made condensers of glass plates with coatings of lead—such as are still known as *Franklin plates*. In this, as he himself soon learned, he had, however, been anticipated by both Smeaton and Bevis in England. He also magnetized and demagnetized steel needles and even reversed their polarity by means of the discharge current from his condensers.

Having established to his satisfaction the principles of action of Leyden jars, Franklin, in whom the inventive spirit was native and irrepressible, constructed two forms of electric motor driven by means of the energy

thus stored. Simple mechanical devices operated by the Hauksbee machine, such as the electric chimes and the tourniquet, there were already, but Franklin's motors were no mere modifications of these. The first, called the *electric jack,* was driven by the attractive and repellant forces of two oppositely charged Leyden jars. These were placed diametrically opposite and just outside the periphery of a wheel having some thirty spokes of glass at the ends of which brass thimbles were mounted. The wheel revolved upon a vertical axis and the thimbles were successively attracted, charged and repelled as they passed each jar. The power developed was considerable, being sufficient to maintain a speed of twelve or fifteen turns a minute even when loaded with one hundred Spanish dollars. Franklin deemed it capable of carrying a large fowl "with a motion fit for roasting" if set up before a fire.[1]

The other motor, Franklin's *self-moving wheel,* was a condenser consisting of a circular glass plate coated on both faces and mounted to revolve upon a vertical shaft. Equidistant around the rim of this disk were leaden bullets connected alternately with the coatings. Surrounding the revolving plate were glass columns supporting insulated brass thimbles and these attracted, were charged by and then repelled each passing bullet as the wheel

[1] Franklin: Electricity. Fourth edition—1769, p. 31.

revolved. This motor would make fifty revolutions a minute and run half an hour from a single charge.

In these devices we have a close approach to some later forms of electrostatic apparatus, such as the influence machines of Toepler and Holtz.

With the exception of the lightning rod, which came later, these two machines represent Franklin's nearest approach to practical electrical invention. In the construction of apparatus to illsutrate the principles of the science, to excite surprise or merely to amaze or amuse, he was exceedingly ingenious and fertile. Such toys failed, however, to satisfy the utilitarian spirit which was always strong in him, and he expressed in an oft-quoted passage his chagrin at being able "to produce nothing in this way of use to mankind.[1] What would he say to the gigantic industrial growths from the seed that he helped to sow?

No scientific achievement of Franklin's made so profound an impression upon the public of his day as his demonstration that lightning is an electrical phenomenon and even now nothing is more generally associated with his memory. He was not the first, as we have seen, to compare the noise and spark of the artificial electric discharge with thunder and lightning; but neither Wall nor Grey nor yet Nollet appear to have

[1] Franklin: Electricity, p. 37.

considered the possibility of an experimental verification of their suggestion.

Franklin, however, was prompt to propose a method of testing the matter and his plan of erecting an iron rod in the open air was successful at Marly in France, and the result confirmed at Paris and in England long before his own famous experiment with the kite had been attempted. Subsequently he made many determinations of the sign of the discharge from the clouds which he found to be commonly but not universally negative.

The subject of atmospheric electricity appealed to him strongly and from two very different points of view.

Being a man of science and given to speculation he developed a theory of the electrification of clouds and of the phenomena of thunder storms; being a practical man he invented the lightning rod. This device was intended to afford a double protection, dissipating the atmospheric charge by the action of points and conducting the current of discharge harmlessly to earth. Whatever we may now think of the adequacy of the means employed, the usefulness of the lightning rod in one respect is undisputed. It gave a sense of security and peace of mind to those who availed themselves of it, and thus robbed the thunder storm of its terrors to the timid if not of its actual dangers. Who does this, if nothing

more, for three or four generations of weak-minded mortals is surely to be regarded as a benefactor!

Franklin's theory of thunder storms, or as he termed it in his fifth letter, written in 1749, his "new hypothesis for explaining the several phenomena of thunder gusts" was ingenious and altogether original. He regarded the sea as the source of atmospheric electricity. "When," he says, "there is a friction among the parts near its surface the electrical fire is collected from the parts below; it is then clearly visible in the night; it appears at the stern and in the wake of every sailing vessel; every dash of an oar shows it and every surf and spray. In storms the whole sea seems on fire. The detached particles of water then repelled from the electrified surface continually carry off the fire as it is collected; they rise and form clouds and those clouds are highly electrified and retain the fire until they have an opportunity of communicating it."

Subsequently Franklin convinced himself by experiments upon sea water that he was mistaken in supposing the phosphorescence to be of electrical origin. He then considered whether particles of air might not by their friction against objects upon the surface of the earth become electrified and impart their charge to the clouds and he attempted to test this assumption by blowing a stream of air by means of bellows against an insulated conductor, but the experiment did not succeed. A later

theory,—or as he modestly termed it, a conjecture—proposed in his twelfth letter was based upon the fact, which he had in the meantime established, that the charge of clouds was usually negative. When a body, according to Franklin, contains a certain amount of the electric fluid it is neutral or unelectrified. An excess produces the phenomena of positive electrification and deficiency that of negative electrification. Water in its ordinary condition is neutral but if it be converted into vapor without loss of the electric fluid it is capable of containing a greater quantity on account of the increase of volume. Clouds formed by the evaporation of unelectrified water will therefore show a negative charge. Such a cloud coming within striking distance of the earth will receive additional electricity in the form of a flash and will impart the fluid received to other clouds in the neighborhood until equilibrium is established. To account for the occasional positive charge of thunder clouds Franklin imagined that a cloud having had its deficiency of electricity supplied from the earth might be compressed from the action of the wind, "so that part of what it had absorbed was forced out and formed an electric atmosphere around it in its denser state."

That speculations upon so difficult a subject as the origin of atmospheric electricity should afford no final theory, even at the hands of a Franklin, was inevitable. The necessary experimental basis for such a result did

not yet exist. After a century and a half of further study our electricians are still seeking a solution of the problem. Whether the phenomena are to find their ultimate explanation, as we now imagine, in the ionization of the air remains for the future to determine.

Of speculation as to the nature of electricity before Franklin's time and among his contemporaries, there had already been an abundance but it was for the most part vague, with a tendency to the occult. This was particularly true of the German experimenters of the period of whom Hoppe[1] in his "History of Electricity" says that they did not understand the significance of their own experiments and so mixed their facts with fantasy as to render them unintelligible to others. He compares the bombastic and vaguely phrased work of such writers with the productions of Franklin, of which he says: "I have read no work of the former century so easy and clear of understanding as those letters which Franklin sent to London and through which in the course of a few months he became world renowned." There is nothing obscure about Franklin's presentation: even in his theorizing, there is no misunderstanding him. He thought essentially as we do to-day although compelled to express himself in part at least in the language of his period. How many writers on science in our day can hope to be as easily understood in the year 2060?

[1] Hoppe: Die Elektrizität, p. 26.

In any consideration of his theory of electricity it must be remembered that the doctrine of energy did not yet exist, that fire was regarded as a subtile fluid penetrating the pores of bodies, and that Franklin in speaking of " the electric fire " had in mind an analogous medium. The mathematical concept of potential was yet to be developed. Although Ellicott in 1746 and also Gralath had attempted to determine electrostatic attractions by means of the balance, and Nollet had used an electroscope with repelled threads of which he measured the divergence, the science of electrical measurement was to await the advent of Cavendish and Coulomb.

Franklin contributed nothing of a quantitative character to the science of electricity, but he was an accurate observer of phenomena. His fondness for speculation was unbounded and he indulged it freely upon every subject.

Speculation is an essential feature of theory building, particularly in the beginnings of a science. In Franklin's case it was controlled by practical common sense, sound logic and a rare definiteness of conception. After any speculative flight the strongly utilitarian side of his nature was sure to assert itself as in this characteristic passage, which follows an attempt to explain the action of points. " Nor is it of much importance to us to know the manner in which nature executes her laws; 'tis enough if we know the laws themselves. 'Tis of real

use to know that china left in the air unsupported will fall and break, but *how* it comes to fall, and *why* it breaks are matters of speculation. 'Tis a pleasure indeed to know them, but we can preserve our china without it."[1]

Franklin thought of electricity as a fluid penetrating all forms of matter. It consisted, according to his view, of mutually repellant particles each of which was individually attracted by the particles of matter. Under these attractions the electric fluid would pour into a substance, permeating it until equilibrium between the attractions and repulsions occurred. Further additions of the fluid would distribute themselves upon the surface, forming what Franklin termed an electrical atmosphere and the body would be positively charged.

This theory, which I shall not attempt to outline further, fulfills the requirements of a scientific hypothesis in that it afforded a definite mechanical concept by means of which all the facts known at that time could be brought into relation with one another and harmonized. When it became known to Franklin's contemporaries on the other side of the water it provoked a lively discussion. Although totally at variance with the views prevailing in Europe, his new *one fluid theory* appealed to many. His adherents were known as the Franklinists, and the controversy between them and their opponents

[1] Franklin: Electricity, p. 62.

was violent and prolonged. It lasted, indeed, until the interest in electricity itself began to wane towards the end of the century.

That Benjamin Franklin should be the author of the one theory of electricity which of all the views on this subject comes nearest to our twentieth century concept may seem strange; for with him electricity after all was merely an episode, a form of intellectual diversion into which he was drawn by accident in middle life and which he abandoned after a few years for other, and, as it seemed to him, more practical things. We need not, however, be astonished that he left his imperishable impress upon the science of his time. A man who in the middle of the eighteenth century rejected the doctrine of action at a distance and insisted upon the necessity of a universal medium pervading all space, and who, at the very zenith of Newton's fame, repudiated the corpuscular theory and thought of light as transmitted by a vibratory motion, must be recognized as possessing a native endowment unequaled by any of the intellects of his day. Had the many-sided Franklin been one-sided, and that side turned to science, what might he not have accomplished? But then he would not have been our Benjamin Franklin!

THE MODERN THEORIES OF ELECTRICITY AND THEIR RELATION TO THE FRANKLINIAN THEORY

By Professor Ernest Rutherford, F.R.S.

[Address delivered in Witherspoon Hall, Wednesday, April 18.]

I AM very much honored by the invitation of the American Philosophical Society to take part as a foreign representative in the celebrations in honor of the memory of its distinguished founder, Benjamain Franklin. I feel, however, that it is only in the strictly formal sense that I can be regarded as a foreign representative. When I recall that Franklin, during the period of his greatest scientific activity, was a citizen of that nation to which I have the honor to belong, it seems to me quite natural that the English people should vie with that of America in generous rivalry in doing honor to the contributions made by Franklin to scientific knowledge. May we not justly regard the scientific achievements of Benjamin Franklin as the joint heritage and pride of the English speaking peoples?

In reviewing the life of Franklin, one cannot fail to be impressed by the many-sidedness of the activities displayed by him during his long career. But there is no

province in which we can form a better estimate of his intellectual eminence, clearness of vision, and philosophic insight than in his original contributions to the then infant science of electricity. My colleague, Professor E. L. Nichols, has given you an interesting review of his scientific work as a whole, and it now devolves on me to point out the significance of his contributions to knowledge in the special domain of electrical theory. This may seem at first sight a relatively simple task, but after emerging from the ordeal of preparing this lecture, I can personally say with some confidence that this is far from being the case.

The theory of electricity developed by Franklin, generally known as the "one fluid" theory, must be regarded as the greatest of his additions to electrical knowledge, for it has exerted a profound influence on the development of electrical ideas, and, even after the lapse of a century and a half of ceaseless activity in electrical research, still holds its place, though in a modified form, as the generally accepted explanation of the connection between positive and negative electricity.

In the course of this lecture I shall first endeavor to outline the fundamental conceptions of Franklin's theory, and then trace the gradual growth of our ideas on the nature of electricity and the connection of Franklin's theory with the views of electricity that are held to-day.

When Franklin began his electrical experiments in 1746 the knowledge of electricity was of an extremely fragmentary and elementary character. It was known that a number of bodies, when rubbed, became electrified and the repulsions and attractions of electrified bodies had been observed. Dufay had shown that two different kinds of electricity were developed by rubbing glass and resin, which he termed "vitreous" and "resinous" electricity, respectively, or what we should now term positive and negative. His work, however, was very little known at the time, and it is very doubtful whether Franklin in his earlier experiments was acquainted with it.

The fame of the shock produced by the accumulator of electricity, or Leyden jar, discovered by Cunaeus of Leyden in 1746, had immediately spread throughout the civilized world, and there was an intense and widespread interest in the properties of this "electrical fire," as it was then called. At this period it was not difficult for anyone to become rapidly acquainted with the work already done in electrostatics, and the amateurs of science were on an equal footing with their more professional brethren in the pursuit of further knowledge.

It was at this period that Franklin became interested in electrical experiments, mainly through the instrumentality of Peter Collinson of Edinburgh, who had presented an electrical machine to the Library Company

of Philadelphia. Animated at first probably by curiosity to see for himself the effects produced by this mysterious new agent, Franklin rapidly contracted the fever of the scientific discoverer. In his first communication, addressed in the form of a letter to Collinson, he starts by giving an admirable and clear statement of the action of points in "drawing off" and "throwing off" the electrical fire. He then proceeds to formulate his views of electrical action in the following words:

"We had for some time been of opinion that the electrical fire was not created by friction, but collected, being really an element diffused among and attracted by other matter, particularly by water and metals." Later follows a description of the experiments which had led him to these conclusions:

"A person standing on wax and rubbing the tube, and another person on wax drawing the fire, they will both of them (provided they do not stand so as to touch one another) appear to be electrized to a person standing on the floor; that is, he will perceive a spark on approaching each of them with his knuckle.

"But if the persons on wax touch one another during the exciting of the tube, neither of them will appear to be electrized.

"If they touch one another after exciting the tube, and drawing the fire as aforesaid, there will be a stronger

spark between them than was between either of them and the person on the floor.

"After such strong spark, neither of them discover any electricity.

"These appearances we attempt to account for thus: We suppose, as aforesaid, that electrical fire is a common element, of which every one of the three persons above mentioned has his equal share, before any operation is begun with the tube. *A,* who stands on wax and rubs the tube, collects the electrical fire from himself into the glass, and his communication with the common stock being cut off by the wax, his body is not again immediately supplied. *B* (who stands on wax likewise), passing his knuckle along near the tube, receives the fire which was collected by the glass from *A,* and his communication with the common stock being likewise cut off, he retains the additional quantity received. To *C,* standing on the floor, both appear to be electrized, for he, having only the middle quantity of electrical fire, receives a spark upon approaching *B,* who has an over quantity; but gives one to *A,* who has an under quantity. If *A* and *B* approach to touch one another, the spark is stronger because the difference between them is greater. After such touch there is no spark between either of them and *C,* because the electrical fire in all of them is reduced to the original equality. If they touch while electrizing the equality is never destroyed, the fire only

circulating. Hence have arisen some new terms among us; we say *B* (and bodies like circumstanced) is electricized positively; *A* negatively. Or rather *B* is electrized plus; *A* minus. And we daily in our experiments electrize bodies plus or minus, as we think proper. To electrize plus or minus, no more needs to be known than this, that the parts of the tube or sphere that are rubbed do, in the instant of the friction, attract the electrical fire, and therefore take it from the thing rubbing; the same parts immediately, as the friction upon them ceases, are disposed to give the fire they have received to any body that has less. Thus you may circulate it as Mr. Watson has shown; you may also accumulate or subtract it upon or from any body, as you connect that body with the rubber, or with the receiver, the communication with the common stock being cut off."

In this letter we have the first use of the terms positive and negative electricity, which now sound so familiar to our ears.

In his next letter, he still further elaborates his views and gives an explanation of the action of the Leyden jar or bottle as an accumulator of electricity. In this we have a remarkably clear statement of his views of the connection between positive and negative electricity.

"At the same time that the wire and the top of the bottle is electrized *positively* or *plus,* the bottom of the bottle is electrized *negatively* or *minus,* in exact propor-

tion; that is, whatever quantity of electrical fire is thrown in at the top an equal quantity goes out at the bottom.[1] To understand this, suppose the common quantity of electricity in each part of the bottle, before the operation begins, is equal to twenty; and at every stroke of the tube, suppose a quantity equal to one is thrown in; then after the first stroke, the quantity contained in the wire and upper part of the bottle will be twenty-one, in the bottom nineteen; after the second, the upper part will have twenty-two, the lower eighteen, and so on, till, after twenty strokes, the upper part will have a quantity of electrical fire equal to forty, the lower part none; and then the operation ends; for no more can be thrown into the upper part, when no more can be driven out of the lower part. If you attempt to throw more in, it is spewed back through the wire or flies out in loud cracks through the sides of the bottle.

"The equilibrium cannot be restored in the bottle by inward communication or contact of the parts, but it must be done by a communication formed without the bottle, between the top and the bottom by some non-electric,[2] touching or approaching both at the same time; in which case it is restored with a violence and quick-

[1] "What is said here, and after, of the *top* and *bottom* of the bottle is true of the *inside* and *outside* surfaces and should have been so expressed."

[2] The term "non-electric" is applied to a metal or other conductor of electricity. An "electric" is an insulator of electricity.

ness inexpressible; or touching each alternately, in which case the equilibrium is restored by degrees.

"As no more electrical fire can be thrown into the top of the bottle when all is driven out of the bottom, so in a bottle not yet electrized, none can be thrown into the top, when none *can* get out at the bottom, which happens either when the bottom is too thick, or when the bottle is placed on an electric *per se*. Again, when the bottle is electrized, but little of the electrical fire can be drawn out from the top by touching the wire, unless an equal quantity can at the same time get in at the bottom. Thus, place an electrized bottle on clean glass or dry wax, and you will not, by touching the wire, get out the fire from the top. Place it on a non-electric and touch the wire, you will get it in a short time; but soonest when you form a direct communication as above.

"So wonderfully are these two states of electricity, the plus and minus, combined and balanced in this miraculous bottle! situated and related to each other in a manner that I can by no means comprehend! If it were possible that a bottle should in one part contain a quantity of air strongly compressed and in another part a perfect vacuum, we know the equilibrium would be instantly restored within. But here we have a bottle containing at the same time a *plenum* of electrical fire and a *vacuum* of the same fire, and yet the equilibrium cannot be restored between them but by a communication

without! though the *plenum* presses violently to expand, and the hungry vacuum seems to attract as violently in order to be filled."

One cannot but admire the remarkable clearness of this explanation of the then mysterious action of the Leyden jar. In fact, with few alterations it would serve the same purpose to-day. The fundamental conditions to be fulfilled in charging and discharging the jar are brought out with such emphasis and point that it is not difficult to imagine Franklin, in the guise of a modern professor of physics, expounding the action of the Leyden jar to a class-room of inattentive students—an image that may appeal more forcibly to my colleague, Professor Nichols, than to my audience.

While the theory of Franklin of the action of the Leyden jar was a notable advance in electrical ideas, we can now see clearly the imperfections in his explanation. The idea of electrical induction still remained to be fully developed, and it was not till nearly a century later that Faraday clearly laid down the true action of the glass or dielectric.

In a later letter in 1749, Franklin returns again to his views of the nature of this electrical fluid:

"The electrical matter consists of particles extremely subtile, since it can permeate common matter, even the densest metals, with such ease and freedom as not to receive any perceptible resistance.

"If any one should doubt whether the electrical matter passes through the substance of bodies, or only over and along their surfaces, a shock from an electrified large glass jar, taken through his own body, will probably convince him.

"Electrical matter differs from ordinary matter in this, that the parts of the latter mutually attract, those of the former mutually repel each other. Hence the appearing divergency in a stream of electrified effluvia.

"But though the particles of electrical matter do repel each other, they are strongly attracted by all other matter.

"From these three things the extreme subtilty of the electrical matter, the mutual repulsion of its parts, and the strong attraction between them and other matter, arises this effect, that when a quantity of electrical matter is applied to a mass of common matter, of any bigness or length within our observation (which hath not already got its quantity), it is immediately and equally diffused through the whole.

"Thus, common matter is a kind of sponge to the electrical fluid. . . . But in common matter there is (generally) as much of the electrical as it will contain within its substance. If more is added, it lies without upon the surface, and forms what we call an electrical atmosphere; and then the body is said to be electrified.

"It is supposed that all kinds of common matter do not attract and retain the electrical with equal strength and force for reasons to be given hereafter. And that those called electrics *per se,* as glass, etc., attract and retain its strongest and contain the greatest quantity.

"We know that the electrical fluid is in common matter, because we can pump it out by the globe or tube. We know that common matter has near as much as it can contain, because, when we add a little more to any portion of it, the additional quantity does not enter but forms an electrical atmosphere. And we know that common matter has not (generally) more than it can contain, otherwise all loose portions of it would repel each other, as they constantly do when they have electric atmospheres."

The conception of Franklin that electricity was an indestructible and subtile fluid which permeated all bodies was a not unnatural one to occur to a philosopher of that time, for it was the century in which the notion of material fluids was invented to explain diverse physical phenomena, for example, heat and magnetism. But the great merit of Franklin lies in the explanation of positive and negative electricity by means of a single fluid. Every unelectrified body is supposed to contain its normal quantum of this electrical fluid. A body is positively electrified when it contains an excess of this

fluid and negatively when it has a defect or has lost a part of its normal quantity. In addition, Franklin clearly recognized that the charging of a Leyden jar resulted from a disturbance of its electrical equilibrium, which was restored by discharging the jar.

In a later letter he describes his ingenious investigations to show that the electricity in the jar does not reside in the metal coatings but on the surface of the glass itself, but for our purpose we must be content with only a passing reference to this classical experiment.

It is hardly necessary to mention here the extraordinarily wide-spread interest in the work of Franklin that very rapidly followed the publication of his scientific letters. The lucidity of his writings no doubt materially contributed to this result, for in this respect Franklin was in marked contrast to some of his scientific contemporaries. Without detracting in the least from the merit of these philosophers, it is not unreasonable to suppose that the turbidity of their writings was a fair index of the state of their conceptions of electrical actions.

There has been a tendency in later days among some writers to claim priority for Dufay over Franklin in the conception of the electrical fluid. There appears to be no satisfactory foundation for this belief. Dufay certainly recognized that different kinds of electricity were developed by rubbing glass and resin. This, however,

was a purely experimental observation, and he appears never to have put forward any definite electrical theory to account for his results.

From the point of view of the philosophers at that time, the main defect of Franklin's theory lay in the fact that it failed to offer any explanation why two bodies, negatively electrified, should repel each other. To overcome this objection John Symmer, an Englishman, put forward in 1759 a modified form of Franklin's views, now known as the "two fluid" theory.

On this theory, a neutral body contains an equal amount of two distinct electrical fluids which give rise to positive and negative electricity respectively. Each portion of the one fluid repels itself, but attracts the other. On this view, positive and negative electricity are two distinct entities instead of one as supposed by Franklin.

On account of its simplicity the theory of Franklin at first met with general acceptance, for it offered a reasonable explanation of the facts known at that time. As electrical knowledge advanced, it began to be recognized that Franklin's theory must be extended in order to account fully for the observed facts. Aepinus, an ardent advocate of Franklin's hypothesis, showed that it was necessary to introduce the idea not only that the electrical fluid repelled itself and attracted neutral matter, but that the particles of matter repelled each other.

With these modifications, the one fluid theory and its rival were mathematically identical, and it was gradually recognized that it was impossible to devise any obvious experimental test to decide between them. Under the weight of these new hypotheses, however, the one fluid theory lost its original simplicity and gave way to some extent to its rival, and Aepinus himself finally became an unwilling convert. It is not necessary to discuss further the conflict between the two theories. The victory for the time inclined to the side of the two fluid theory, but there were always adherents to Franklin's hypothesis, especially in England.

The idea that there were two distinct electrical entities was repugnant to the minds of many, and it was seen that the modified Franklin theory served to explain the experimental facts equally as well as the other, while at the same time it possessed the merit of only requiring one electrical fluid.

The conflict between these two theories which appeared so real and vital at the time has to us lost much of its significance. We recognize that there is much in common between the two theories, and that both are equally successful as an explanation of electrostatics, and it was quite fitting that both theories should take their place, side by side, as alternative explanations of the same phenomena.

We must rapidly pass over the period following Franklin, which was devoted to a more complete understanding of electrical actions and the formulation of the subject of electrostatics on a quantitative and mathematical basis. The idea of electric fluids repelling or attracting each other with Newtonian forces varying inversely as the square of the distance, lent itself readily to a complete and satisfactory mathematical theory of electrostatics.

As the subject developed on mathematical lines, the conception of the electric fluids became more and more abstract, and lost all physical significance. The fluids became mere mathematical figments to serve as centers of forces of attraction or repulsion acting at a distance.

The general attitude at that time has been well put by J. J. Thomson: "The physicists and mathematicians who did most to develop the 'fluid theories' confined themselves to questions of this kind, and defined and idealized the conception of these fluids until any reference to their physical properties was considered almost indelicate."

While the eighteenth century was mainly devoted to the study of electrostatics, *i. e.,* to the study of the phenomena of electricity at rest, and may be considered to be the age of the electroscope and of the Leyden jar, the nineteenth was chiefly occupied with a consideration of the properties of the electric current, *i. e.,* of

electricity in motion, and was the age of the galvanometer and battery and of its successor, the dynamo. As the importance of current electricity became more and more obvious on the theoretical as well as on the purely practical side, the subject of electrostatics, which figured so prominently in the infancy of the subject, fell from its high estate, and there was a tendency as the century advanced to relegate it more and more to the museum of scientific curiosities, as of interest mainly to the antiquarian, and of no obvious importance to the development of electricity, except perhaps to serve as mental pabulum for the training of junior students.

This statement is hardly an exaggeration of the general attitude of the scientific world to electrostatics twenty years ago. But a great and sudden change soon came to pass. The rapid series of discoveries beginning with the experiments of Hertz on electrical waves in 1886, the discovery of X-rays by Rontgen in 1895, of radioactivity by Becquerel in 1896, and the investigation of the discharge of electricity through gases, once more attracted attention to the importance of the fundamental ideas of electrostatics and to the connection between positive and negative electricity.

No more interesting indication of this rehabilitation of the subject of electrostatics can be shown than the fact that the Leyden jar is now an indispensable adjunct of wireless telegraphy, and that the gold leaf electro-

scope, which figured so prominently in the development of electrostatics more than a century ago is in use throughout the world as the most reliable instrument for investigations in radioactivity.

We have seen that at the beginning of the nineteenth century the subject of electrostatics had been developed on a purly mathematical basis of forces acting at a distance, and that but little physical significance was attached to the conception of the electric fluids. It required the genius of Faraday to attract attention again to the physical character of the fluids themselves and to combat the then almost universal notion of forces acting at a distance. To a man of the keen physical insight of Faraday, the idea that the attraction and repulsion of bodies was due merely to forces acting at a distance was very repugnant, and he strenuously championed the necessity of a medium, by means of and through which forces could be transmitted, also emphasizing the great importance of considering the medium as the seat of the electrical and magnetic forces instead of the fluids themselves.

In illustration of these ideas, Faraday introduced the conception of lines of electric and magnetic force, with which we are now so familiar. The old notion of action at a distance, which had done such great service in formulating the mathematical theory of electrostatics, died hard, but its fate was sealed by the development of

the ideas of Faraday in mathematical form by Clerk Maxwell.

Following the publication of Maxwell's famous "Electromagnetic Theory of Light" most English physicists became converts to the views of Faraday and Maxwell, though the theory was little known or understood outside of that country. It required the verification of Maxwell's theory by the classical experiments of Hertz on electrical waves to draw instant and universal attention to the new point of view. At once the old notion of action at a distance gave way to the more rational and physical conception that electric and magnetic effects were due to stresses and strains in the medium or ether which filled all space and penetrated all bodies.

On these views, the energy of the electric current, for example, is not transferred through the wire itself, but mainly through the medium surrounding the wire. Attention for the time was thus transferred from the actual carriers of the electric current to the medium surrounding them.

We shall now consider another great advance made by Faraday in showing the very remarkable relation that exists between electricity and matter. Following the discovery of the voltaic cell, it had been dimly recognized that there existed a close connection between electricity and matter, but the exact nature of this relation was made clear by Faraday's famous experiments on elec-

trolysis of solutions. When an electric current is passed through conducting chemical solutions, known as electrolytes, chemical decomposition takes place, and the products of the decomposition appear at the electrodes. In the passage of a current through acidulated water, for example, the components of the water molecule, hydrogen and oxygen, are set free at the electrodes.

Faraday supposed that the passage of electricity through a solution resulted from a decomposition of the chemical substance into positively and negatively charged carriers or *ions*. Under the influence of the electric field there was a migration of the positive and negative ions in opposite directions, the positive ions moving to the negative electrode and vice versa.

Faraday observed that the weight of matter appearing at the electrodes, for the passage of a definite quantity of electricity through various chemical solutions, bore a very simple and intimate relation to the atomic weights of the elements. The weight of any element set free was directly proportional to its atomic weight divided by a whole number which might be 1, 2, 3 or more, depending on what is known as the "valency" of the element. For example, the weight of gold deposited for the passage of a given quantity of electricity was 65.5 times the weight of hydrogen. The atomic weight of gold relative to hydrogen is 196.6, so that in this case the dividing number was three.

This result, as we shall see, is most simply explained by supposing that the charge carried by a hydrogen atom is a natural and indivisible unit of electricity, and that the various ions may carry a charge which is an integral multiple of this unit charge. For example, an atom of oxygen carries a charge of two units, of gold three, and of tin four.

Quite apart from their practical aspect, the results obtained by Faraday were of the greatest importance in indicating that there was a close relation between electricity and matter, and that electrical manifestations must be ascribed, not to matter in bulk, but to the atoms or molecules composing it. In addition they clearly showed that the currents obtained from the voltaic battery resulted from the charges set free by the chemical decomposition of the substances employed.

The full theoretical significance of Faraday's work was not recognized until nearly half a century later, when Helmholtz and Weber suggested that the results of electrolysis were very simply explained by supposing that electricity was *atomic in structure*. On this view, electricity, like matter, is not infinitely divisible, but appears in definite small lots, as it were, which cannot be further subdivided. This natural unit of quantity of electricity is the charge carried by the hydrogen atom in the electrolysis of water, and every quantity of electricity must be an integral multiple of this natural unit. It is

impossible to obtain any quantity of electricity which is a fraction of this unit.

The term "electron" was applied by Johnstone Stoney an a convenient name for this "atom" of electricity. We have already seen how this point of view at once gives a deep physical significance to the results observed by Faraday. The possibilities of this new hypothesis were quickly recognized by the mathematical physicists, Larmor and Lorentz, as affording a probable explanation of many of the more recondite relations that existed between electricity and matter.

The electronic theories developed by them supposed that the atom of matter consisted in an aggregation of positive and negative ions or electrons in rapid motion, forming, as it were, a miniature planetary system.

It was recognized that a charged particle in motion always radiated energy when its motion was hastened or retarded. Since a charged particle moving, for example, in a small circular orbit is constantly and strongly accelerated towards its center, it must act as a powerful radiator of energy. This at once suggested that the electron rotating within the atom was the mechanism which gave rise to light. This conception was developed notably by Lorentz, who predicted that the period of vibrations of the electrons must be altered by exposing the radiant source in a magnetic field. This prediction was verified a few years later by the experiments of

Zeeman, who observed that the bright lines of the spectrum were displaced and broken up into a number of separate lines by exposing the source of light in a strong magnetic field. The full significance of the "Zeeman effect" will be discussed a little later.

In this development, theory was distinctly in advance of experiment, and we shall now go back for a moment and trace the gradual development of a new line of attack which has yielded results that, in the last ten years, have profoundly modified and extended our conceptions of electricity and matter.

It had early been recognized that there were distinct differences in the discharge of positive and negative electricity. A sharp point, for example, discharges negative more readily than positive electricity, while the appearance of the spark is different at the two discharging terminals. This difference in appearance of the discharge is still further accentuated when a discharge is passed through a rarified gas. Anyone who has witnessed the beautiful and varied luminous effects produced when an electric discharge is passed through a vacuum tube, cannot fail to have been impressed by the remarkable differences in the distribution of luminosity at the two electrodes. This dissymmetry in the discharge appeared at first to indicate that there existed a profound and radical difference between the behavior of positive and negative electricity, but we shall see later that these dif-

ferences now appear to result from a difference in the size of the carriers of the electric discharge, rather than in the electricities themselves.

At a very low pressure of the gas in the tube there is a very remarkable change in the character of the discharge. A type of radiation is emitted from the negative electrode or cathode which travels in straight lines and produces a marked luminosity in the walls of the tube and in a number of phosphorescent substances placed in the path of the rays. These "cathode" rays, apparently first observed by Varley in 1857, were investigated in detail by Crookes. Unlike ordinary light, these rays are readily bent from their path by a magnetic field. Crookes supposed that they consisted of negatively charged particles projected at a great speed from the cathode, and, with almost prophetic insight, considered them to be not molecules or atoms of matter but as he expressed it, "a new or fourth state of matter." In support of his views, Crookes showed that the particles exerted a mechanical pressure when they impinged on bodies, and were able to fuse a platinum plate exposed to their bombardment.

For a space of nearly twenty years the true nature of these rays was a subject of much controversy. The English school adopted the material hypothesis advocated by Crookes, while the Continental physicists con-

sidered that the rays were not corpuscular but consisted of a special type of wave motion in the ether.

A great advance was made in 1894 by Lenard when he showed that the cathode rays were able to penetrate matter opaque to ordinary light, and that the cathode rays could be passed through a thin window and their properties examined outside the vacuum tube.

The discovery of the X-rays a little later directed scientific attention to the great importance of elucidating the true nature of the cathode rays. J. J. Thomson, in 1897, succeeded in completely demonstrating the general correctness of the material hypothesis of Crookes. The cathode rays did in truth consist of negatively charged particles, which moved in the vacuum tube at the enormous speed of about fifty thousand miles per second. But a most remarkable fact was brought to light. The mass of the particles of the cathode stream were extraordinarily small, only about 1/1000 of the mass of the hydrogen atom. This was a great advance for it indicated that the atom was not the smallest subdivision of matter. These "corpuscles" or "electrons" thus behaved as the bodies of smallest mass known to science.

J. J. Thomson soon showed that electrons of the same small mass could be produced from different kinds of matter in a variety of ways. Electrons, for example, are freely emitted from the incandescent carbon filament of an electric lamp; they are emitted also from a metal

plate exposed to the action of ultraviolet light. In these cases an external agent like the electric discharge, heat or light is required to set free these electrons from matter, but a still further advance was made when it was found that electrons of exactly the same mass were emitted from radium and other radioactive substances without any external stimulus. The radioactive bodies are continuously engaged in the apparently congenial task of spontaneously hurling electrons from their mass with velocities much greater than can be impressed on the electrons set free in a vacuum tube. The discovery of Zeeman, coupled with the electronic theory of Lorentz, still further broadened the field of application of electronic theories. The verification of Lorentz's predictions by Zeeman showed that the light waves must arise from a vibrating or rotating electrically charged particle and the comparison of theory with experiment showed that the particle carried a negative charge and was of the same small mass as the electron. The electron was thus shown to be a constituent of all matter, and it was seen that the phenomenon of light arose from the rapid movement of electrons within the atom.

We have seen that, following the theories of Maxwell, attention was directed from the current in the wire to the medium surrounding it. In these developments, however, scientific attention was again concentrated on the actual nature of the carriers of electricity. The dis-

charge of electricity through gases was found to be simply explained by supposing that the electricity was carried by positively and negatively charged particles or ions which moved in opposite directions in an electric field.

The discontinuous structure of these electric charges was shown by making each ion the center of a visible globule of water. The actual number of these ions in the gas could be counted, and the charge on the ion or the natural unit of electrical quantity was measured. At the same time, J. J. Thomson and Drude independently attacked the difficult problem of the mode of transmission of an electric current through a metallic wire. It was supposed that the metallic conductor contained a large number of free electrons carrying a negative charge which could pass freely between the atoms of matter. These mobile electrons were prevented from escaping from the wire by the attractive force of a corresponding quantity of positive electricity, which was carried by the atoms of matter. The carriers of the positive charge were either immobile or moved extremely slowly compared with the electrons. Under the influence of an electric field the electrons were set in motion, and were the true carriers of the electric current. This conception was found to offer a satisfactory explanation of some of the most recondite phenomena shown

by the passage of an electric current through a conductor.

From the above brief sketch we can see how extraordinarily fertile the electronic conception has proved for the explanation of diversified physical phenomena. We believe that the electron is a definite physical entity which has an independent existence. It is present in all matter but can be readily released by a variety of agencies and its properties studied apart from matter.

At the same time, it must be remembered that the presence of an electron can only be detected when it is in rapid motion, and strange to say, the greater its speed the easier it is to determine its properties.

We are now in a position to consider the fundamental question, "What is an electron?" "Is it a fragment of an atom of matter carrying a negative charge, or is it a disembodied electric charge?" "What relation does the electron bear to the atom, which before the advent of the electron posed as the fundamental unit of matter?"

These fundamental problems have to some extent been answered and with remarkable consequences, as we shall see, in clarifying our conception of electricity and matter.

In order to answer these questions, it is necessary first of all to consider what are the effects to be expected when a small charged sphere is set in motion. This problem was first attacked by J. J. Thomson in 1887, and has later been developed by Heaviside, Searle,

Lorentz, Abraham and others. A moving charge acts like an electric current, and a magnetic field is produced round the body on which the charge is distributed. This implies that magnetic energy is stored up in the medium surrounding the charged body and travels with it. In consequence of this, a charged body moving at a definite speed has more energy associated with it than if it were uncharged. Part of this energy is the ordinary mechanical kinetic energy of the body and the rest is electromagnetic energy due to the charge associated with it. A charged body thus behaves as if it possessed additional or "electrical" mass in virtue of its motion. Theory shows that this electrical mass is constant for slow speeds, but increases rapidly as the velocity of the body approaches that of light.

Now imagine that we do away altogether with the material sphere, which acts as the carrier of the charge, and consider the motion of a charge of electricity distributed over a small spherical surface but with no material nucleus.

This charge of electricity when in motion will be surrounded by a magnetic and electric field which travels with it. Energy is consequently associated with it. The moving charge in fact behaves as if it had ordinary mass and has the characteristic property of matter, inertia. It tends to resist any change in the direction or magnitude of its motion. This mass will be constant for small

speeds but will increase for velocities approaching that of light.

The question how far the mass of an electron results from the electric charge associated with it can be put to the test of experiment. For this purpose it is necessary to determine the mass of the electron at different speeds, and to compare the results with those to be expected from theory. Radium is an ideal source of electrons for such experiments, for it expels electrons over a wide range of velocity and some of the swiftest have a velocity equal to 95 per cent. of that of light. Kaufmann by an ingenious method determined the mass of the electrons projected from radium at different speeds and found, as theory had anticipated, that the mass was not constant but increased rapidly as the velocity of light was approached. By comparison of theory with experiment, he found that the mass of an electron was purely electrical in origin and that there was no necessity to suppose that the charge was distributed on a material nucleus. This was a most important and far-reaching conclusion. The electron is not matter at all in the ordinary sense, but a disembodied electrical charge, possessing, however, the characteristic property of mass in virtue of its motion.

But we have seen that the electron is a constituent of all matter and for ordinary speeds has a mass of about 1/1000 of that of the hydrogen atom. The mass of the hydrogen atom would thus be explained if it consisted

of a system of a thousand whirling electrons. This is a fascinating idea and at once offers an explanation of mass which has been such an enigma to science. On such views, matter consists of atoms which in turn are built up of electrons and what we call matter in reality consists of a great number of small electric charges in constant motion. As A. J. Balfour epigrammatically expressed it in his presidential address to the British Association at Cambridge in 1904, "Matter is not only explained but it is explained away."

But what is the relative size of an atom and its constituent, the electron? You will all remember the image employed by Lord Kelvin that if an orange were magnified to the size of the earth the atoms composing it would be about the size of the orange. But the electron in turn is minute compared with the atom. If the atom is magnified to the size of this Hall, the electron would be smaller relatively than a pin's head. Thus, if we suppose that the atom of hydrogen is composed of a thousand electrons in rapid motion, these will not fill the volume of the atom but will merely occupy it.

Although, as we have seen, electrons are regarded as the ultimate units of which the atoms of matter are built up, we know far more about the electron than the atom. We can determine its size and its mass and predict its behavior at any speed, and recent results indicate that we are in a fair way to determine its shape.

I must now reluctantly face the question which I have put off as long as possible: "What is positive electricity?" for here I recognize that I must tread with caution. Science to-day has arrived at a fairly clear conception of negative electricity, but with regard to positive, it is unable to speak with the same definiteness. If we have a negative electron as a carrier of negative electricity, it might reasonably be expected that there should exist a corresponding positive electron. An examination of the carriers of positive electricity in a vacuum tube has, however, disclosed the fact that positive electricity is always found associated with bodies atomic in size, which have several thousand times the mass of the negative carrier or electron. Even in radium and the other radioactive bodies, in which the electrical processes appear to be extremely fundamental in character, the α particle or carrier of the positive charge has a mass about that of the atom of the rare gas helium. We have no evidence at all that a positive electron of mass small compared with the atom exists. A positively charged ion is now regarded as an atom or molecule which has lost one of its constituent electrons, but this method of expression, in a sense, begs the fundamental question of the true character of positive electricity.

In order to answer this question, it is probable that we must know the exact connection which exists between positive and negative electricity and the medium or

ether. Larmor has supposed that the electron consists of a strain center in the ether, which is transferred through the medium in somewhat the same way as a knot can be slipped along a rope. Such a theory, however, presupposes the existence of the corresponding and complementary positive electron. This difficulty in regard to the difference between positive and negative electricity is well illustrated by the attempts that have been made to form a mechanical or rather electronic model of the chemical atom. In a remarkable paper called "Aepinus atomized," published by Lord Kelvin in 1903, but whose title I think we might in justice change to "Franklin and Aepinus Kelvinized," Lord Kelvin adopted the fundamental conception of the one fluid theory of Franklin, as modified by Aepinus, and applied it to the atom of matter. The atom was supposed to consist of a number of mobile negatively charged particles or electrons, held in equilibrium by a system of mutual forces, similar to that devised by Aepinus in mathematically developing Franklin's theory. Since an atom is electrically neutral, and must consist of an equal quantity of positive and negative electricity, such a view was equivalent to supposing that the atom consists of a number of mobile negative electrons embedded in a sphere of positive electrification. This conception of atomic structure devised by Lord Kelvin has been still further developed by J. J. Thomson. The latter has mathemat-

ically investigated the properties of model atoms consisting of a large number of rapidly revolving electrons held in equilibrium by their mutual repulsions and the forces due to a fixed and immobile distribution of positive electricity. He has shown that such electronic systems imitate in a striking way many of the most fundamental properties of the chemical atom.

We must here, however, content ourselves with only a passing reference to these brilliant attempts to discover the character of atomic structure.

We thus see that, on modern views, positive electricity plays a very minor rôle in electrical effects, compared with the omnipresent electron. The electrons are the bricks of the atomic structure, while positive electricity plays the humble but important part of the mortar to bind them together. Such a division of respective rôles may appear somewhat arbitrary, but it suffices for the present as the simplest method of explaining the experimental facts.

After a century and a half of great scientific activity, which has added enormously to our knowledge of electricity, the ideas of electricity, which are in vogue to-day bear a remarkable resemblance to those advocated by Franklin in the infancy of the subject. This resemblance must have been obvious to you all in the light of the recent developments which have been touched upon in this paper. We believe that there is one kind of elec-

tricity, namely, negative electricity, which is carried in small definite units by the electrons. These electrons are a mobile constituent of all matter and are able to move freely through metals.

A negatively electrified body is one which has more than its normal complement of electrons, while a positively charged body is one that has lost one or more of its component electrons. This point of view is remarkably analogous to that employed by Franklin in his one fluid theory, with the difference that negative electricity plays to-day the part that he assigned to positive. The electrical fluid of Franklin is atomic in structure, and is made up of electrons which consist of actual disembodied electrical charges. With these alterations, the methods of expression used by Franklin in discussing positive and negative electricity is very similar to that in use to-day.

It is certainly a remarkable and noteworthy fact that the theory of Franklin put forward at a time when the knowledge of electricity was of the scantiest character, should have survived, even in a modified form, during a century which has witnessed such an enormous increase in our knowledge of electricity. We must not, in consequence of this fact, unduly exaggerate the importance of the contributions of Franklin to electrical knowledge nor underestimate the fundamental importance and magnitude of the advances made in electricity since Franklin's time.

We recognize that Franklin possessed unusual clearness of physical insight, but we must refrain for that reason from endowing him with the uncanny gift of prophetic vision.

With regard to the question "What is electricity?" so often asked the scientist by the layman, science cannot at present venture an adequate answer. Nor is this surprising when we consider what a fundamental part electricity plays in nature. We have seen that electricity is a constituent of all matter, and, indeed, that what we call matter is electricity in motion. Attempts have been made to explain electricity as a manifestation of the universal medium or ether, but until we know more of the properties of the ether, such theories must of necessity lack physical definiteness. Even if we may ultimately explain electricity in terms of the ether, there remains the still more fundamental problem, "What is the ether?" An attempt to explain such fundamental conceptions seems of necessity to end in metaphysical subtilties.

THE UNIVERSITY OF PENNSYLVANIA

Conferring of Honorary Degrees

[In The American Academy of Music, Thursday, April 19.]

After the Academic procession had entered the Auditorium, prayer was read by Rev. Dr. Alexander Mackay-Smith, Episcopal Bishop-Coadjutor of the Diocese of Pennsylvania.

"Alma Mater" was then sung.

The Class of 1906, College, through its President, Mr. A. R. Ludlow, presented a memorial tablet to Franklin, to be placed on the wall of the Houston Club, and it was received by Vice-Provost Edgar F. Smith, in behalf of the University and the Houston Club.

"Ben Franklin" was then sung.

Conferring of Honorary Degrees

The candidates were presented by Wharton Sinkler, M.D., Samuel F. Houston, Joseph B. Townsend, Jr., and George H. Frazier, of the Board of Trustees.

The degrees were conferred by Provost Harrison in the following words:

Edgar F. Smith — President of the American Philosophical Society. Worthy successor of Franklin, Rittenhouse, Jefferson, Bache. Eminent chemist; distinguished

for his original work upon Electrolysis. Vice-Provost of the University of Pennsylvania. Humane. Beloved of God and men.—LL.D.

WILLIAM BERRYMAN SCOTT—Interpreter of world changes. Historian of the rocks and of past forms of life. Traveler over many lands, without the aid of the physicist; at times, however, using him, but not in accord with him. Lineal descendant of Franklin, and agreeing with him that sense is preferable to sound. Distinguished professor of geology and palaeontology at Princeton University.—LL.D.

EDWARD CHARLES PICKERING—Professor of astronomy and director of the Harvard College Observatory. "It was on no earthly shore his soul beheld the vision," but with reverent observation the stars in their courses have been, through him, a light to us from pole to pole. Student of the relation of stellar distance to the intensity of illumination. Distinguished founder of the first physical laboratory in America.—LL.D.

HUGO DE VRIES—King of the plant world. Foremost investigator. Research contributor to the knowledge of the physiology, heredity and cross-breeding of the vegetable kingdom. Distinguished over two continents for his publications upon species variation. Professor of plant anatomy and physiology at the University of Amsterdam.—LL.D.

ALBERT A. MICHELSON — Head professor of physics in the University of Chicago. To-day considered among the foremost physicists in the United States. Noted especially for his mathematical and experimental contributions upon the nature and properties of light. — LL.D.

ERNEST RUTHERFORD — McDonald professor of physics at McGill University, Montreal. First of the physicists of Canada. Doubtless the leading authority in the world upon radio-activity, the latest and most important development in physical science. — LL.D.

EDWARD LEAMINGTON NICHOLS — Especially noted for his investigations on radiation and upon matter at low temperature. His researches have shed light upon the strange property of certain substances to become self-luminous by day or by night. Professor of physics at Cornell University. — LL.D.

WILLIAM KEITH BROOKS — Distinguished for his biological exploration of our Atlantic Coast and of the West Indies; for the depth of his contributions to marine zoology; for his permanent studies in heredity and evolution and for his classical and philosophical essays thereon. Professor of zoology at the Johns Hopkins University. — LL.D.

WILLIAM PATERSON PATERSON — Professor of divinity in Edinburgh University and sometime professor of

systematic theology at Aberdeen. Welcome to the privileges of a son of the University of Pennsylvania. From Aberdeen came Pennsylvania's first Provost; from Edinburgh, our Medical School—whose emblem has always been the thistle. Sincere teacher of the knowledge of things divine; comprehended briefly in that undying question: "What does the Lord require but to do justly and to love mercy and to walk humbly."—LL.D.

HENDRIK ANTOON LORENTZ—Facile Princeps amongst the physicists of Holland, and peer of any of his scientific associates upon the continent of Europe. Noted especially for his work on mathematical physics and upon the "Electron Theory." Professor of mathematical physics in the University of Leiden. Representative of the Batavian Society for Experimental Philosophy, of Rotterdam, of which Franklin himself was a member.—LL.D.

ALOIS BRANDL—Professor of philology in the University of Berlin. Representative of the University of Berlin, and of the Prussian Academy of Sciences. Shakesperean scholar. Student of "the nature and history of man as disclosed by speech." His personality as charming as his scholarship.—LL.D.

SIR GEORGE HOWARD DARWIN—Distinguished son of an illustrious father. Astronomer and mathematician. Plumian Professor of astronomy and experimental phi-

losophy at the University of Cambridge, England. Student of the effects of tidal friction upon the earth and moon. The name and fame of father and son will endure until "Tideless sleep the seas of time!"—LL.D.

WILLIAM P. HENSZEY—Theoretical and practical engineer. Notable for his contributions to civilization, through his scientific work in the evolution of the modern American locomotive. Of great judgment and foresight in the solution of difficult mechanical problems. Through his efforts all the world becomes akin.—Sc.D.

JAMES GAYLEY—Noted for his contributions to the advancement of the science of analytical chemistry. Metallurgist. Combining in himself, in the highest degree, the rare qualities of scientific knowledge, and the power of transmuting this knowledge into practical results. Distinguished alumnus and trustee of Lafayette College.—LL.D.

HAMPTON L. CARSON—Able student. Master of legal, historical, constitutional and political science. Great power of orderly massing of facts. Attorney-General of the Commonwealth of Pennsylvania. Loyal and devoted son of the University of Pennsylvania.—LL.D.

JOHN WILLIAM MALLET—Distinguished chemist of the University of Virginia, founded by Thomas Jeffer-

son, one time President of the American Philosophical Society. Happy coincidence of the meeting of the chief chemist of the University founded by Jefferson and of the chief chemist of the University founded by Franklin —truly notable ancestors. His activity as chemist upon the scene of war has been devoted to the more faithful application of his great energy in the ways of peace.—LL.D.

In Absentia—GUGLIELMO MARCONI—Investigator, theoretical engineer, inventor. Born under the shadow of that ancient university, Bologna, in the land where dwells the Eternal City. Postmaster-General for thousands who "go down upon the sea in ships," and soon for the world.—LL.D.

SAMUEL DICKSON—Chancellor of the Law Association of Philadelphia. Learned in the law. Fit successor of Tilghman, Rawle, Ingersoll, Hopkinson and Sergeant—all College graduates, as he, of the University of Pennsylvania. Independent thinker.—LL.D.

ANDREW CARNEGIE—Lord Rector of the University of St. Andrews. Thou hast sought and thou hast found; thou hast knocked and it hath been opened unto thee; thou hast given of what thou hast received. World benefactor.—LL.D.

EDWARD VII—King, Defender of the Faith, Emperor of India—Represented by the person of his Ambassador [Sir Henry Mortimer Durand, '05 LL.D.]—LL.D.

At the Court of St. James, upon the 12th day of August, 1763, His Majesty King George II being present at the King's Most Excellent Majesty in Council, it was ordered that the Right Honourable the Lord High Chancellor of Great Britain do cause Letters Patent to be prepared and passed under the Great Seal, authorizing the first Provost, William Smith, to collect funds from all well-disposed persons for the assistance and benefit of the College, Academy and Charitable School in Philadelphia; and upon the 9th day of April, 1764, the Archbishop of Canterbury, together with Thomas and Richard Penn, addressed a joint letter to the Trustees of the College, congratulating them upon the great success which had attended the efforts of the first Provost, through His Majesty's Royal Brief.

The Trustees of the University of Pennsylvania—the successors of the Trustees of the same Foundation—bearing in mind the interest which His Majesty, the then King of England, so graciously showed in the infant Institution in the Colony of Pennsylvania, now confer upon His Majesty, Edward VII, impersonating England, the highest Degree in their power to bestow.

" England,—

" This royal throne of kings, this sceptred isle,
This earth of majesty, this seat of Mars.
This other Eden, demi-paradise;
This fortress, built by nature for herself,
Against infection, and the hand of war;
This happy breed of men, this little world;
This precious stone set in the silver sea,
Which serves it in the office of a wall,
Or, as a moat defensive to a house,
Against the envy of less happier lands;
This blessed plot, this earth, this realm, this England."

BENJAMIN FRANKLIN AND THE UNIVERSITY OF PENNSYLVANIA

By the Hon. Hampton L. Carson,
Attorney-General of Pennsylvania.

[Address delivered in The American Academy of Music, Thursday, April 19]

Mr. Provost, Members of the Board of Trustees of the University of Pennsylvania, Distinguished Guests, Ladies and Gentlemen:

On a Sunday morning in October, one hundred and eighty-three years ago, there entered this city — then a town of about six thousand inhabitants — an unwashed, footsore lad — a printer's runaway boy. His only change of clothing was thrust into his pockets, and he munched a roll as he walked up High street. He was without a friend and was four hundred miles from home. The place of his birth and the harbor he had chosen were then inconsiderable clearings in a wilderness which stretched to the westward for three thousand miles, unknown to history and almost unknown to geography.

Sixty-seven years later, his body was borne to the grave, preceded by the clergy of all denominations. His pall was carried by Governor Mifflin, Chief Justice McKean, and the President of the Bank, Samuel Powell,

the aristocratic and wealthy Mr. Bingham, and David Rittenhouse, the astronomer. His hearse was followed by the Secretary and Members of the Supreme Executive Council, by the Speaker and Members of the General Assembly, the Judges of the Courts and other officers of the Governmnt, the Bar, the Mayor and Corporation of the City, the printers and journeymen and apprentices, the American Philosophical Society, the College of Physicians, the Cincinnati, the College of Philadelphia, and numerous trade and civic associations, while twenty thousand people attended and witnessed the ceremony of interment. Beyond the Atlantic Mirabeau pronounced his eulogy before the National Assembly of France, and the Abbé Sieyes, the President, addressed a letter of condolence to the Congress of the United States. His mortal remains sleep beneath a plain marble slab rising but a few inches from the ground, with the simple inscription, "Benjamin Franklin."

In a few hours this distinguished audience will assemble at his grave. *"Si monumentum requiris, circumspice."*

Who can question the greatness of this man? He meets the definition of Emerson that "He is truly great who is what he is from nature, and who never reminds us of others." What man in all the centuries, Christian or pagan, resembles Franklin? Of whom does he remind us? Take him in the astonishing aggregate of his

many parts, divide his character into sections, and analyze each, and what result do you find which has its exact counterpart, or which suggests that it is but a *fac simile* of that which made another man famous or successful? We may speak of industry, sobriety, frugality, punctuality, intelligence, inventiveness, economy, prudence, ambition, wit, humor, culture, style, courage, patriotism, judgment, sagacity, firmness, dignity, simplicity, knowledge, sympathy and foresight, all of which go to make up the business man, the author, the citizen, the statesman, the philosopher and the sage—but, after all, these are generic terms. We are familiar with them in reading or in daily contact with living men, and can point to a thousand instances of each, but of all these traits in human nature, there is a distinct species which is peculiar to Franklin and to him alone, while in the strange totality of attributes he is abnormal and colossal.

Others, it is true, have been industrious, intelligent, inventive and economical, but with all the remarkable lads in mind that you have known, whether from actual acquaintance or from books, it must be admitted that this seventh son in a family of ten brothers and sisters and six half brothers and sisters, who was deprived of schooling at the end of a year, who dipped candles and set wicks, and whose mind fed on Bunyan, DeFoe, Plutarch, Locke, Burton's Historical Collections, Cotton Mather, and controversial theological tracts, was a very

uncommon boy. He drew the strength of his body from a sturdy race of blacksmiths on his father's side, and the strength of his mind from a remarkable mother, the daughter of "a learned and godly Englishman," an adept in Indian languages, a skilled surveyor, and the courageous enemy of persecution.

He was indeed fortunate in obtaining employment so soon after his arrival, but there must have been something engaging in his manners and trustworthy in his countenance to account for his having met and captivated the Governor, Sir William Keith, within a month, for whose subsequent perfidy he was in no way responsible. After two or three false starts he became a well-known printer, editor, compiler, publisher, bookseller, bookbinder and stationer. He made lamp black and ink, dealt in rags, and sold soap and live geese feathers. He became a burgess, a justice of the peace, a clerk of the General Assembly, Postmaster General, the Colonel of a regiment, and studied French, Spanish and Italian. As he prospered in business, he rose in the public esteem and projected plans for public improvement. Until he came, the sidewalks were unpaved, the streets were unlighted, the fire brigade had no existence, the night watch was unknown, the town was without a library, without a hospital, without a college, without a philosophical society; houses were cold until he gave them stoves, chimneys smoked until he cured them, de-

structive fires raged until he tamed the lightning, and ships tossed in danger until he cast oil upon the waves. Wherever he was present, weighty matters were discussed and projects moved. He thought, he spoke, he wrote, he acted. He did things and inspired others to do them. With Lord Bacon he believed that *a good motion never dies.* No matter what the meeting he attended, whether composed of business men, doctors of medicine, philosophers or politicians, he was always chosen President or Chairman.

He was Socratic in his method of reasoning; but, he was eminently practical and not metaphysical. He imitated Addison in his style; but what essay of Addison's resembles the speech of "Father Abraham"? It is in large part a collection of other men's sayings and of ancient saws; but Franklin made the collection and cut the diamonds. He improved on Sydney when he said "God helps those who help themselves." He improved on Bishop Horne when he said "Sloth eats more than rust," and "The used key is always bright." He improved on Ben Johson when he said "Keep thy shop and thy shop will keep thee," and he added as his own, "He that riseth late must trot all day, therefore drive thy business, let it not drive thee." Poor Richard's Almanac illustrates Sir John Russell's definition of a proverb—"The wisdom of many but the wit of one." Was there ever a better description of the dignity of labor than "A plowman

on his legs is higher than a gentleman on his knees"? Or anything truer than "The eye of a master will do more work than both his hands"?

He infused humor into practical citizenship. During the administration of Sir Robert Walpole, the transportation of convicts to this country was regarded as a very great grievance. Franklin wrote to the Minister the thanks of the colonists for the maternal care of Britain so strongly manifested in this instance, and as a satisfactory proof of American gratitude sent him a collection of rattlesnakes, which he advised him to introduce into His Majesty's Gardens at Kew, so that they might propagate and increase, assuring him that they would be as beneficial to His Majesty's English dominions as the British rattlesnake convicts had been to America.

When difficulties arose among the members of the Continental Congress as to how they should communicate to the soldiers of Sir William Howe the principles for which the Continental army was fighting, Franklin had copies of the Declaration of Independence printed in English and German and wrapped around packages of tobacco, which were distributed by farmers and fishermen in the British and Hessian camps. When the Declaration of Independence was being signed, Charles Carroll, of Carrollton, is said to have remarked, "We must be unanimous about this; we must all hang to-

gether." "Yes," said Franklin, "or we will hang separately." In fact, it is asserted that the reason why Jefferson and not Franklin was chosen to write the Declaration of Independence was because solemn John Adams dreaded that he would put in a joke.

It was his scientific reputation and his invention of the lightning rod, together with his well-known persistency of purpose, that converted the following incident into an epigram. An English philosopher insisted that blunt conductors were the only safe ones. King George the Third, as though disdaining to owe his safety to the invention of an enemy, during the war put balls upon the rods on the palace, and persisted in this, notwithstanding the protest of the Royal Society. A wag then wrote:

"While you, King George, for safety hunt,
And sharp conductors change for blunt,
The nation's out of joint;
Franklin a wiser course pursues;
And all your thunder fearless views
By sticking to the point."

He was arithmetical in his demonstration to Dr. Priestley that the colonies could not be subdued, by writing after the action at Bunker Hill, "Britain at the expense of three millions, has killed one hundred and fifty Yankees, this campaign. During the same time

sixty thousand children have been born. From these data, the mathematical head of our dear, good friend, Dr. Price, will easily calculate the time and expense that may be necessary to kill us all. Tell him, as he has sometimes doubts and despondencies about our firmness, that America is determined and unanimous."

These instances illustrate his methods of influencing men, and are enlivened by his characteristic humor, but he was never regarded as a trifler. When Lord Chatham consulted him about his plan of conciliation, the noble earl said, "I pay you these visits, that I may rectify my judgment by yours, as men do their watches by a regulator." He had a serious side born of conviction and supported by determined courage. At critical moments he bore himself with a dignity that was sublime. His creed was based upon adamantine faith in the rights of the people. He had a penetrating eye, and saw into the hearts of men as clearly as into the truths of nature. He read motives and scrutinized systems of government, and analyzed statutes and measures with a vision as searching and a purpose as lofty as Hershel with his telescope studied the stars. He saw farther into the true province and business of a free government and the duties and just limits of the powers of rulers than any man of his time. Lacking original constructive power he never failed in detecting the weaknesses or inconsistencies of a government and indi-

cated with unerring finger the point of divergence from the principles of eternal truth. He saw that what a government had to do, whether of a colony or of a nation, was to restrain its citizens from invading each others rights, and compel them to respect each others freedom. This was the keynote of his long struggle against the Proprietaries of Pennsylvania, and made his heart so brave and his eye so quick and his guard so true. He fought the same fight that David Lloyd had waged and stood on the same basic principles for which Pym had thundered and Hampden died. He refused to let Logan's sophistries confuse his head or the Proprietary interest seduce his faith. He stood forth as Democracy incarnate. He never lost his grasp upon chartered rights and never bowed the neck or bent the knee. It was this spirit that made him the trusted representative of the Colonies in England, and sustained him in noble silence when ribaldry and abuse were rained upon his brow. His character was unscorched by the cry of "Thief," and the burning letters "FUR" which were hissed at him by Wedderburn were transformed by the magic of French divination into "VIR." In the gayest of ancient capitals, surrounded by statesmen, courtiers, savants and flatterers, he was the favorite of royalty, but remained an untainted American. As a statesman he wrote his name beneath the Albany Plan of Union, the Declaration of Independence, the French

Alliance, the Treaty of Peace and the Constitution of the United States, thus aiding more than any other man in building the national temple from foundation to capstone. His life was so prolonged that after standing by the cradle, he witnessed the marriage of American liberty to Constitutional law. While writhing with the pangs of death, he stretched forth a withered hand to pluck the poisonous serpent of slavery from the bosom of the land he loved.

The basis of his character was like the bedrock of a mountain. In its breadth, its depth and its solidity, he was unapproached by any man of his day and by few men of any time. His intellect was of that vast and comprehensive order which entitles him to rank with Bacon and Locke, with Newton and Boyle. With him, "Knowledge was not a couch whereon to rest a searching and restless spirit; or a terrace for a wandering and variable mind to walk up and down with a fair prospect; or a tower of state for a proud mind to raise itself upon; or a sort of commanding ground for strife and contention; or a shop for profit and sale; but a rich storehouse for the glory of the Creator and the relief of man's estate." He illustrated the saying of Solomon that "a wise man is strong; yea, a man of knowledge increaseth strength." He framed every action and plan for the safety of the state and the elevation of her sons, with a reference to the unchanging

decisions of the Day of Judgment. He saw that of all sorts of tyranny, the most insupportable was ignorance; that of all injustice, the greatest was that of neglect of youth; that of all follies, the rankest was that of indifference to the future. He looked beyond and beneath the varied phenomena of the present and he saw the transformation of the open country into a town; the conversion of farms into town lots, the rise of wharves and yards and factories; the erection of workmen's houses; the coming of the usual accessories to supply the calls of the population, merchants, traders, mechanics, butchers, bakers, grocers, and he saw towns converted into counties, and counties into states, and states into a nation, and a nation into a unit in the great confederacy of the world. Were citizens to be an aggregation of untrained animals, or highly trained and educated men? Hence he was led to his Proposals Relating to the Education of Youth.

Out of these proposals, conceived in the spirit of Defoe's Essay upon Projects, which he had read when a boy of twelve, and modestly stated as the act of "some publick spirited gentlemen," avoiding as much as he could, according to his usual rule, the presenting himself to the "publick" as the author of any scheme for their benefit, came the academy which was incorporated by Thomas and Richard Penn, proprietors and governors of the province, on the thirteenth of July, 1753,

under the name of "The Trustees of the Academy and Charitable School in the Province of Pennsylvania." A confirmatory Charter was granted in June, 1755 — contributions were obtained in Great Britain, and grants of land from the proprietaries through the exertions of the First Provost, Dr. William Smith, augmented by gifts of the Assembly. Then followed a long and bitter struggle which grew out of and formed an important part of the political conflicts of the day. It was inevitable that Franklin and Dr. Smith should clash so long as Proprietary rule prevailed. The academy felt the weight of Revolutionary displeasure, and neither the patronage of the Penns nor the favors of the crown could aid it. While Franklin was in France, an act of confiscation was passed, and in 1779 a new institution arose which became known as "The University." After Franklin's return, the act of spoliation was redressed, and in 1789 so much of the former act as took away the estates and franchises of the college was repealed upon the ground that it was "repugnant to justice, a violation of the Constitution of the Commonwealth, and dangerous in its precedent to all incorporated bodies." It was found impracticable to sustain two institutions with like purposes — a meeting was held at Franklin's home but a few months before his death — all differences were adjusted, and in September, 1791, the college and the university were united on a lasting basis under the name

of "The Trustees of the University of Pennsylvania." The Governor of the State was made *ex-officio* a member of the board of trustees, and an annual statement of the funds was to be laid before the legislature. Thus were the dreams and ambition of Franklin — the founder — realized by a redemption of the pledge of the Constitution of 1776 that "all useful learning shall be duly encouraged and promoted in one or more universities."

In his autobiography Franklin refers in moderate terms, but with conscious pride, to his association with the University. He says, "I have been continued one of its Trustees from the beginning, now near forty years, and have had the very great pleasure of seeing a number of the youth who have received their education in it distinguished by their improved abilities, serviceable in public stations and ornaments to their country."

In calling the bead roll of distinguished names related to the institution, either as teachers, trustees or graduates, it is a matter of interest to note that of the class of 1757 there was Benjamin West, the painter, the founder of the Royal Academy and its President from 1792 to 1815; that nearly one sixth of the signers of the Declaration of Independence were University of Pennsylvania men. Franklin was the founder and a trustee; James Wilson was a trustee and a professor; Benjamin Rush was a professor; Robert Morris, James Smith, Thomas McKean and George Clymer were trustees; and Francis

Hopkinson and William Paca were graduates. John Nixon, who was the first to read publicly the Declaration to the people, was a trustee. Among the framers of the Constitution of the United Sates, the names of Franklin, Wilson, Morris and Clymer reappear with those of Thomas Mifflin, Jared Ingersoll, Thomas Fitzimmons, Trustees, and Hugh Williamson, who was a professor of mathematics. Of the Continental Congress, there were two presidents, Mifflin and McKean; Duché, the first chaplain, was the professor of oratory and a trustee, while of the members who were graduates, there were Andrew Allen, William Bingham and Richard Peters of Pennsylvania, Philemon Dickinson of Delaware, Henry Marchant of Rhode Island, Whitmel Hill of North Carolina, William Grayson of Virginia, Joshua Seney of Maryland, John Neilson and Jonathan Dickinson Sergeant of New Jersey. The second chaplain to the Continental Congress was William White, a graduate of the class of 1765, first bishop of Pennsylvania, and presiding bishop of the Episcopal Church of the United States from 1796 to 1836; of soldiers in the Continental Army, there were General Peter Gabriel Muhlenburg of the class of 1763, who stripped his clerical gown from his shoulders in the pulpit to reveal his uniform to astonished eyes; General John Cadwalader, a trustee, who fought a duel with Conway, the head of the Conway cabal against Washington; Colonel

Lambert Cadwalader, of the class of 1760, and Tench Tilghman of the class of 1761, military secretary and aide to General Washington, who bore dispatches to Congress announcing the surrender of Cornwallis. The most conspicuous physicians in the camps and hospital service of the Continental army were John Morgan, Director General and Physician-in-Chief, who held the first medical professorship in this country, William Shippen, Chief Surgeon and a founder of the medical department, Benjamin Rush the first professor of chemistry, and Adam Kuhn the first professor of materia medica. The first Speaker of the Congress of the United States was Frederick Augustus Muhlenberg, a trustee. Of Attorneys General of the United States, there have been Cæser A. Rodney of the class of 1789, Henry D. Gilpin of the class of 1819, and Benjamin Harris Brewster of the class of 1834. Of Secretaries of the Treasury, Robert J. Walker of the class of 1819, and William M. Meredith, a trustee. Of reporters to the Supreme Court of the United States, there were John William Wallace, and William T. Otto, both of the class of 1832. All of the Governors of the State have been *ex-officio* presidents of the Board of Trustees, and seven of them were graduates. Of Chief Justices of the State, we name William Tilghman, John M. Read, George Sharswood and James T. Mitchell, graduates, all of them, the latter of the Law Department. In legal authorship we point to

Anthony Laussatt of the class of 1821, Sharswood of the class of 1828, J. I. Clark Hare of the class of 1834, and William Henry Rawle, of the class of 1842. In science we boast of the names of Ebenezer Kinnersley, David Rittenhouse, John Ewing, who ran Mason and Dixon's line, William P. C. Barton the botanist, James Woodhouse, Franklin Bache, Peter Lesley, Charles M. Cresson, Fairman Rogers, John F. Frazer, and Joseph Leidy, the incomparable anatomist. In the church we point to James Latta, Albert Barnes, William Bacon Stevens, Richard Newton, Charles M. Schaffer, George Dana Boardman, and William A. Muhlenburg, of the Class of 1815, the hymnologist, and author of the beautiful hymns, "I Would not Live Alway," and "Shout the Glad Tidings"; among men of affairs there are Henry Towne, the founder of the Towne Scientific School, Isaac J. Wistar, the founder of the Wistar Institute of Anatomy and Biology, Joseph Wharton, founder of the Wharton School of Finance, Joshua B. Lippincott, the practical founder of the Veterinary School, Henry Seybert, the generous patron of the Chair of Intellectual and Moral Philosophy, Mrs. Bloomfield H. Moore, and Joseph M. Bennett, the practical friends of the higher education of women, Reese W. Flower, the benefactor of the Astronomical Observatory, Henry H. Houston, whose name will be forever associated in the grateful memories of students with the memorial to

his son, Howard Houston, in the shape of Houston Hall, and those numerous friends and donors of the dormitories, whose generous thoughts will bloom perennially like the flowers in the gardens that surround them.

We name with appreciation of their liberality the City of Philadelphia, John Wanamaker, Phebe A. Hearst, Max Uhle, William Pepper, Daniel G. Brinton, Lucy W. Drexel, Dillwyn Parrish, Maxwell Somerville, and Clarence H. Clarke, in connection with the Museum of Archaeology. We point in medicine to Nathaniel Chapman, George B. Wood, D. Hayes Agnew and William Pepper, in Dentistry to James Truman; in literature to Joseph Hopkinson, author of "Hail, Columbia," Henry Reed, the friend and correspondent of Wordsworth, John W. Draper, the author of the History of the Intellectual Development of Europe, Charles Dudley Warner, and to those whose lives still bestow their blessings, and whom it would be a fault to omit—Horace Howard Furness, and S. Weir Mitchell.

Of provosts, the first was Dr. William Smith, a man of such consideration that he was president of every House of Clerical and Lay Deputies from the creation of such a chamber till his physical infirmities rendered him incapable of presiding anywhere; the successively selected preacher, year after year, of all the Church at the consecration of her first three Bishops consecrated

in America. At the convention of the Church in seven States, held in 1785, at Christ Church, in Philadelphia, Dr. Smith was chosen chairman "to consider of and report such alterations in the Liturgy as shall render it consistent with the American Revolution and the Constitution of the respective States, and such other alterations in the Liturgy as it may be advisable for this Convention to recommend."

Dr. Smith was also Chairman of the Committee which revised in 1789 and printed the Book of Common Prayer. The preface is his work. The convention of 1789 appointed him to prepare an address to the President, George Washington, who a few months before had entered upon the untried duty of Chief Magistrate of the United States, and it was his eloquent voice that pronounced before the American Philosophical Society the eulogium upon Benjamin Franklin. From that day to this, the Provostship has been occupied by men of rare force and unfaltering devotion to duty, but I would be false to my own sense of obligation and to the representative capacity which I occupy to-day if I failed to say in this illustrious presence in behalf of the trustees, the professors and alumni everywhere, of the tribute recently paid to the University of Pennsylvania by a graduate of Yale, an ex-President of Cornell, and our accomplished ambassador at the Courts of Continental Europe, in which he ranked her as the foremost in the

oldest and most densely peopled portion of the United States, that the present splendor of the noblest monument yet reared to the memory of Franklin — the glory of the city, the pride of the Commonwealth, and the inspiration of lives in far distant corners of the earth — is largely due to the unselfish toil and the enlightened zeal of Charles Custis Harrison.

We have met to pay tribute, in behalf of the University that he founded, to the memory of the man who always reasoned out his conduct; the sage who never said a word too soon, nor a word too late, nor a word too much; nor did he fail to say the decisive word at the proper moment; who said what he thought, and who did what he said. He preached his moral lessons with gayety as well as power. His venerable face, his floating hair, his shrewd, quick eye, his unclouded amiability, are omnipresent. He dissipated prejudices with playfulness, he rallied the selfishness of individuals and the artifices of government with equal skill and good nature. There was no strain of violence in his blood. There was no hysteria in his voice. There was no fierce denunciation of his enemies. As Laboulaye said:

"Do not expect from him those bursts which raise you above the passing world. Franklin never quits the earth. It is not genius in him, it is good sense expressed in its highest power. Do not seek in him a poet nor even an orator, but a master of practical life — a man to

whom the world belongs. Neither imagine you have to do with a vulgar worldly wisdom. This amiable mocker, who laughs at everything, is not the less kind-hearted, a devoted patriot, and one of the sincerest friends of humanity. His laugh is not that of Voltaire, there is no bitterness in it. It is the benevolent smile of an old man whom life has taught indulgence."

It was a clear conception of the necessity for union against a common foe which animated his plan at Albany; it was his proud and dauntless Americanism which sustained him before the privy council when denounced by Wedderburn as a thief; it was his undying faith in Democracy which preserved him unharmed when worshipped and caressed by the descendant of sixty kings; it was his undimmed vision of the future and his wise sense of present peril which made him an architect of our national government, and for these he must be held in reverential remembrance.

Combining the characters of a great scientific discoverer and a founder of the Republic, in the one capacity, fit to rank with Galileo and Newton, and in the other with Washington, the builder of his own fortune, a poor printer's lad whose daring and happy genius scaled the heights which enthrone the monarchs of mankind, tried by prosperity as well as adversity, self-taught in all he knew, a writer famed for his style without a classical education, beginning life in the garret and the

workshop and ending as the unspoiled favorite of royalty, he never lost his simplicity, his dignity, his strength, his humanity or his courageous faith in government by the people.

For these qualities we honor him, and for his achievements the Muse of History will crown his name with everlasting bays.

If his venerated shade could preside over the deliberations of this hour, would he not say:

"My children, I lived a long time, and the longer I lived, the more convincing proofs I saw of this truth: that God rules in the affairs of men; and if a sparrow can not fall to the ground without his notice, an empire can not rise without His aid. We have been assured in the sacred writings that 'except the Lord build the house, they labor in vain that build it.' I firmly believe this, and I also believe that without His aid we shall succeed no better than the builders of Babel. I have seen the institution that I helped to found, the city, and the state, and the nation that encompasses them, thrive under the blessing of Heaven beyond all expectation and rise in the estimation of men until they have become a part of the active forces of the world. Let them stand for peace and justice. Let men make it a part of their religion to see that their country is well governed; let the nation learn that glory is not to be valued because of bloodshed, nor shall honor be bartered for sacks of gold.

When principle is at stake, let resistance to wrong be unyielding; let laws be just and oppressions and discriminations perish; let men be faithful to their trusts and learn that the wealth and power committed to their hands are stewardships for which they must account. Let men be kindly one to another, not backbiting, reviling, nor bitter in enmity. Let our youth learn that a good name is better than riches, which can not be dissipated by heirs or lost by misfortune; that character should not be like the willow or the poplar, brittle and frangible, but like the oak, tough and enduring: that lives, to be useful, should be active, not passive, and that liberty, to be precious, should be real, not speculative. I see long centuries opening their vistas and emancipated peoples revolving like planets about the central sun of American freedom. I hear nation calling to nation, and shouting like morning stars for joy over their liberation. And for you, my children, trustees in this generation of the rights of the individual and of the larger rights of humanity, I pray that all things may be so ordered and settled by your endeavors upon the best and surest foundations that peace and happiness, truth and justice, religion and piety may be established among you for all generations."

THE UNIVERSITY OF ST. ANDREWS

The Honorary Degree of LL.D.

[Conferred in Witherspoon Hall, Tuesday, April 17]

The candidate, Miss Agnes Irwin, Dean of Radcliffe College, Cambridge, Massachusetts, was presented by S. Weir Mitchell, M.D., LL.D., and Horace Howard Furness, Litt.D. (Cantab.), and the degree was conferred in the following words by

Andrew Carnegie, LL.D.,
Lord Rector

Appearing before you in my official capacity as Lord Rector of St. Andrews, the oldest of Scottish Universities, I deem it peculiarly fitting that the occasion is one in commemoration of Dr. Franklin, for her relations to that eminent man are of the most pleasing character. She it was who in 1759 first made him a Doctor.

Sir, I am charged to assure you and this assembly that she feels to-day that upon no similar act has she reason more profoundly to congratulate herself than upon that of the Faculty of that day who discerned the worth of Dr. Franklin and bestowed upon him this

recognition of his great services, not only to his own country but to the world.

In conversing with Matthew Arnold one day upon America's great men, I remember how impressively he spoke these words, "Franklin's is the weightiest voice that has as yet sounded from across the Atlantic." You of this Society, so conversant with his history, will I believe find no fault with this opinion. The startling triumphs of electricity in our day and the surprises it promises still to give us, the discovery of radium and of numerous other properties in matter, all lead in the direction of Tyndall's famous prediction that we shall finally find the potency of all things in matter. At the very root of this revelation, stands for all time the man who first drew the lightning from the clouds and proclaimed it electricity, matter with something beyond, he in whose honor we are met from various parts of the Earth to-day. His name cannot be omitted in any list of the few supremely great who have exerted a potent influence upon mankind. To the numerous tributes made upon the altar of his memory this day, St. Andrews' University reverently and gratefully begs to be permitted to add hers. She who honored Franklin in life, in death still treasures his memory as one of her most illustrious, perhaps the most illustrious, of all her sons.

I have been entrusted with another pleasing duty. The Senatus has authorized me to perform a ceremony of rare significance.

St. Andrews, which honored the great-grandfather, has voted to confer the same degree of LL.D. on Agnes Irwin, Litt.D., Dean of Radcliffe College, Cambridge, Massachusetts, his well-known, esteemed and worthy great-grandchild. I need scarcely say this action was not prompted by the relationship; claims of heredity could not justify the bestowal of an honor whose proud distinction is that it ever has been and is to-day the reward of personal achievement alone. Knowledge of the work and character of the Dean of Radcliffe is not confined to her own country. Like her great grandfather's name, hers also has sounded across the Atlantic. Miss Irwin last summer, as I have reason to know, found that she was neither unknown nor unappreciated among the principals and professors of the Scottish universities. Principal Donaldson of St. Andrews was one of several principals with whom Miss Irwin spent a week in Scotland. I can assure her he was fully aware of her career when he suggested that she should be thus honored, and St. Andrews's Senatus, very jealous always of its honors, I am desired to tell you is well assured its degree, in this instance, is abundantly deserved.

How rare the combination of happy circumstances! The Scottish University that first gave to Franklin his

title of Doctor in St. Andrews, Scotland, after a lapse of one hundred and forty-seven years, now bestows the same title upon his great-grandchild—a woman, and deputes its Lord Rector, born a subject of the Monarchy as Franklin was when he received his degree, and now a citizen of the Republic as he became, to present it to her here in Franklin's home before such a gathering as this, assembled to do honor to his memory. We can imagine with what feelings he would look down upon all this. No one knows that he may not. Let us therefore, following Plato's advice, allure ourselves as if with enchantments, indulging the hope that he does behold and beams approvingly upon it. It is all so delightful, so graciously beautiful, that I bless the kind fate that has made me an humble instrument in the ceremony.

The minute of the Senatus is as follows:

At the Ordinary Meeting of the Senatus Academicus held on 3rd April, 1906, the Senatus considered the Report of the Committee on the Honorary Degree of LL.D., and Miss Agnes Irwin, Litt.D., Dean of Radcliffe College, Cambridge, Massachusetts, U. S. A., having been formally nominated for the degree of LL.D., it was unanimously agreed to confer the degree upon her.

THE MEMORY OF FRANKLIN

By S. Weir Mitchell

[Read at the Dinner, April 20.]

A memory only? nay, for us who find
Familiar here the impress of his mind,
Warmed by his thought when glow the evening fires.
Hearing his genius in the whispering wires,
More than a memory he seems to tread
Our streets to-day, the quickest of the dead!
We know the face, the dome-like build of head,
The mirthful lips by humorous habit bred,
The sterner lines that mark the will to meet
In equal wise or victory or defeat.
How near us seems this nature frank and kind,
This equal comrade of the larger mind,
And yet so near the heart of all mankind.
Unharmed by flattery and unstirred by praise
He moved serenely through laborious days
Befriended ever by one gift of heaven
Not always surely unto genius given,—
The cool self-judgment void of all pretense,
The sense uncommon men call common-sense.
So lives in memory he who stands confessed

Of every thought to-night the welcome guest.
Lo at his name there rise securely great
The strong yore fathers of our infant state,
Whose gage of duty boldly challenged fate.
What happy stars shone radiant on the birth
Of that ripe harvest of our virgin earth,
Men of a day when Freedom asked of Fame
Heroic souls,—and large the answer came!
Two hundred busy years have passed away
Since in his humble home an infant lay:
Beside his cradle passed the mistress Fates
On whose decree the hidden future waits.
No frowning shapes foretold disastrous hours,—
Fair were the forms that promised fruit and flowers.
There tranquil Science to the infant brought
The prescient insight of illumined thought,
Saw with proud eyes the answering flame of heaven
Unto the questioning hand of genius given,
And felt with him the joy of those who find
The hidden secrets of the eternal mind.
The Muse of Letters whispered in his ear
"Thou shalt be mine, and lo, I give thee here
The wise of elder days thy friends to be
As men unborn shall turn for friend to thee;
Thou shalt be mine," she cried, and gave the boy
The unfailing magic of her matchless joy,

Graced with expression's charm his birthday hour,
And on his cradle left her gift of power.
The queen of History in that lowly room
With glowing visions filled the silent gloom,
While past his couch swept on and swift away
All the strange drama of his future day
Till with a word of influence bending down
Each gift she left that wins for man renown,
And at the last Achievement's laurel crown.
Then at his side there lingered for a while
The Comic Muse and with her constant smile
Gave the wide gamut of her range of mirth
To meet and mock the ills and cares of earth,
Left where he lay the shining sword and shield
Of ready humor well he learned to wield
And with her joyous laughter called away
These phantom prophets of his natal day.
Take then my toast, " A great man's memory "—
" A man so various that he seemed to be
Not one, but all mankind's epitome."

ADDRESSES

FROM SISTER SOCIETIES

AND

OTHER INSTITUTIONS

OF LEARNING

[Presented in Witherspoon Hall, Tuesday, April 17]

IL MINISTERO DI AGRICOLTURA, INDUSTRIA E COMMERCIO D'ITALIA

CONSOLATO
di
S. M. IL RE D'ITALIA.

Philadelphia, Pa., April 17th, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia, Pa.

Mr. President:

It is my privilege and great pleasure to tender you, on behalf of the Royal Department of Agriculture, Industry and Commerce of Italy, which I was especially delegated to represent on this memorable occasion, the heartfelt felicitations for the festivities your Society is celebrating.

There are two hundred years from the memorable day in which one of the greatest glories of this country was born. Great was the event as great were the consequences which were felt in this country and across the ocean, and Italy to-day feels herself bound to you as a friend and as an admirer. The American Nation, after having had, like Italy, her war of independence, her heroes, her Cincinnatus, her Fabricius, also had her

celebrities, among whom Benjamin Franklin, by common consent of the world, holds one of the first places.

Italy entertaining the greatest admiration at the marvellous expansion and wonderful material growth of this glorious republic, one of the most powerful and the most respected members of the community of nations, wishes to join you on this occasion to do honor to him, who illustrated humanity in an astonishing multiplicity of ways, in an infinite number of points. By the instruction which Franklin gave by his discoveries, by his inventions and by his achievements in public life, he established a claim upon the gratitude of mankind, so broad that history holds few who can be his rivals. The Boston boy, the young printer, and later on the inventor, the diplomat and the patriot, are pictures which are familiar to the world.

Franklin's enterprise and ability and his good sense in all matters, formed the admiration of his fellow men, so that intellectually there are few men who are his peers in all the ages and nations. His inventive genius was commemorated in Italy by the Italian sculptor Monteverde, with the celebrated statue "the genius of Franklin," representing a youth tearing the lightning from the sky and imprisoning it in the earth, thus illustrating Franklin's invention of the lightning rod, consequent on his discovery of the identity of lightning

with electricity. Franklin's letters in the proceedings of his experiments in electricity translated into Italian, made Italians familiar with his discoveries as well as with the fascinating style and humor with which the progress of his studies is related, and I will add that Italy interested in the discoveries of her own electricians, from Volta to Marconi, looks to-day upon this Country with admiration for the American inventor, Benjamin Franklin.

In presenting to your Society, with all enthusiasm, the felicitations of the Department of Agriculture, Industry and Commerce of Italy, I wish to further express the admiration of my Country for America, a nation not only glorious on land and sea, but great in science and inventions, whose son, Benjamin Franklin commands the gratitude and respect of the world.

COUNT NASELLI.

CAMBRIDGE UNIVERSITY

SOCIETATI PHILOSOPHICAE AMERICANAE
S. P. D.
UNIVERSITAS CANTABRIGIENSIS.

Rem nobis pergratam fecistis, viri nobiscum et generis et linguae et studiorum communium vinculis coniunctissimi, quod annos ducentos Conditoris vestri a die natali nuper feliciter exactos propediem celebraturi, feriis vestris saecularibus etiam nostram Universitatem interesse voluistis. Societatis enim vestrae Conditor ille insignis, non modo reipublicae vestrae maximae inter cives maximos erat numeratus, sed etiam universi generis humani amore summo praeditus. In publicis autem rebus diu versatus, populi magni vixdum nascentis legatus erat inter exteros acceptissimus. Philosophiae vero illius, quae ad vitae cotidianae commoda praesertim spectat, imprimis studiosus, per annos plurimos e prelo suo quot libros, quanta animi prudentia, quanto sententiarum acumine instinctos, civium suorum in multitudinem immensam emisit! Idem scientiae novae velut augur et praenuntius perspicax, vim electricam etiam nubium fulgura generare primus omnium comprobavit, ipsoque caelo fulmen eripuit. Non immerito igitur

Societatis vestrae patrona est Minerva ipsa, non iam belli praeses sed scientiarum regina, quam vestro in sigillo caeli in nubibus inter lucis radios sedere cernimus. Ergo ad Societatem, numinis tam benigni patrocinio defensam, professorum nostrorum ex ordine legatum imprimis idoneum mittimus, qui festis illis diebus Conditoris vestri sepulcrum non sine reverentia inviset, Societatis vestrae incunabula non sine gaudio contemplabitur, urbis vestrae per vias tot arborum silvestrium nominibus feliciter ornatas ad aulam vestram hospitalem libenter incedet, in ipsa denique amoris fraterni sede bene nominata nostrum omnium in vos omnes animum fraternum declarabit. Valete.

Datum Cantabrigiae
Kalendis Martiis
A. S. MCMVI°.

REGIA UNIVERSITA DI PAVIA

REGIA UNIVERSITA DI PAVIA.

Il Rettore:

Pavia, 22 Febbraio, 1906.

Ho ricevuto con molto piacere il cortese invito alle feste centenarie che si celebreranno a Filadelfia nel prossimo aprile in onore del sommo Franklin. Plaudendo di gran cuore alla nobile iniziativa prego l'Illmo. Signor Presidente di codesta American Philosophical Society di rappresentare nella solenne cerimonia questa Università in cui le dottrine del grande Fisico americano furono caldamente insegnate dal maggiore elettricista d'Italia Alessandro Volta, non solo ammiratore ma anche amico personale di Beniamino Franklin.

Con profondo ossequio,

Illma. (SEAL) Il Rettore,
American Philosophical C. GOLGI.
Society,
Filadelfia.

THE UNIVERSITY OF ST. ANDREWS

The University of St. Andrews claims the privilege of presenting its felicitations to the American Philosophical Society on the occasion of the two hundredth anniversary of the birth of Benjamin Franklin, so notable as Journalist, Statesman, Diplomatist, and man of Science.

The celebration of anniversaries is a ground of congratulation or of regret according as they mark the progress or the decadence of the cause which they commemorate, and if this University is proud to-day, as the recipient may have been proud at the time, of the diploma conferred by it in the year 1759 upon "Mr. Benjamin Franklin, famous for his writings on electricity," the reason is that the magnificent development of learning and philosophy in the United States, as we know them, had its germ in the spirit of freedom and intelligence which displayed itself in that great citizen before the States were a nation.

The University of St. Andrews, through its Rector, sends greeting to the American Philosophical Society as a body of friends and fellow students, to whose minds it desires to be present on an occasion which concerns the entire Republic of Letters.

(SEAL)

JAMES DONALDSON,
Vice-Chancellor.

THE UNIVERSITY OF GLASGOW

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
INDEPENDENCE SQUARE, PHILADELPHIA,
PENNSYLVANIA,
UNITED STATES OF AMERICA.

With much satisfaction the University of Glasgow has received from the American Philosophical Society an invitation to take part in the celebration of the two hundredth anniversary of the birth of Benjamin Franklin.

The Members of the Senate recognize in the ingenuity, the versatility, and the practical sagacity of Franklin the qualities of the typical American, and in his philosophical bent, his skill in diplomacy, and the wisdom of his statesmanship, proof that he was at the same time a citizen of the world.

They delight to recall that during Franklin's visit to this country he came into contact not seldom with one of Glasgow's most famous professors, the author of the Wealth of Nations, and they have good ground for believing that the benefit was not all on one side. Nor are they likely to forget that while Franklin's remarkable experiments in Electricity began in 1746, exactly a

century later, in 1846, began in this University the career of William Thomson, Professor of Natural Philosophy and Member of Senate for fifty-three years, who is at the present day the foremost representative of physical, and especially of electric, science, the Right Honourable Lord Kelvin, a Peer of the Realm, and Chancellor of the University. Franklin, in the eighteenth century, with his hempen thread proved the identity of the lightnings of heaven and the electricity of earth; Kelvin, in the nineteenth, by the electric cable united the Old World and the New.

With great goodwill, therefore, the Members of the Senatus Academicus associate themselves in spirit with the Society founded by Franklin in celebrating with due honour the Two Hundredth Anniversary of his birth, and desire to be represented on the occasion by the following graduates of the University, now residing in the Western Hemisphere:

THOMAS GRAY, B.Sc., Professor of Dynamical Engineering in the Rose Polytechnic Institute, Terre Haute, Indiana, U. S. A.

WILLIAM R. LANG, D.Sc., Professor of Chemistry in the University of Toronto, Canada.

DUNCAN B. MACDONALD, B.D., Instructor in the Semitic Department of Hartford Theological Seminary, Connecticut, U. S. A.

Signed in name, and by authority, of the Senatus Academicus of the University of Glasgow this fourth day of April, 1906.

R. HERBERT STORY,

(SEAL) Principal and Vice-Chancellor.

THE UNIVERSITY OF EDINBURGH

ADDRESS
TO THE AMERICAN PHILOSOPHICAL SOCIETY
FROM THE
UNIVERSITY OF EDINBURGH,
APRIL, 1906.

The University of Edinburgh sends cordial greetings and good wishes to the American Philosophical Society on the auspicious occasion of the 200th Anniversary of the birth of the Society's Founder and First President, Benjamin Franklin, and rejoices to cooperate with the Universities and Learned Societies from all parts of the world in praising a famous man.

The name of Benjamin Franklin is a name of which it especially behoves the great centres of learning to celebrate the memory, for so various were his virtues, so manifold the fields in which he attained preeminence, that the different departments of Academic activity may find each a special and separate ground on which to render him honour.

The Faculties of Arts recall the signal literary gifts, the wisdom and understanding which won for Franklin a foremost place in the illustrious school of 18th century Essayists and Moralists; the Faculties of Law and Political Science are proud to recognise the rare statesman-

ship and unrivalled diplomatic qualities to which America is so greatly beholden; the Faculties of Medicine are mindful that Franklin was the founder of one of the first Hospitals established in the New World; and the Faculties of Science salute him as an investigator whose discoveries have yielded far-reaching and most fruitful results.

Moreover, in his career as a whole, with its lessons of fortitude in adversity and strenuous endeavour for great ends, the Universities rejoice to behold a splendid exemplar and incentive.

It is with pleasure and with pride that the University of Edinburgh calls to mind the special ties which during his lifetime united Franklin with Scotland — his laureation by the University of St. Andrews, his admission as a burgess and guild-brother of the Scottish metropolis, and his friendship with Adam Smith, with David Hume, with Lord Kames, and William Robertson the Principal of the University of Edinburgh.

Time cannot wither Franklin's fame. It is the heartfelt hope of the University of Edinburgh that the prosperity of the American Philosophical Society may be as enduring as the memory of its founder. "Stet fortuna domus."

WILLIAM TURNER,
(SEAL) Principal and Vice-Chancellor.

L. J. GRANT,
Secretary of the Senatus Academicus.

REALE ACCADEMIA DI SCIENZE, LETTERE ED ARTI IN PADOVA

REALE ACCADEMIA
DI SCIENZE, LETTERE ED ARTI
IN PADOVA.

Illustre Signor Presidente, 2 Aprile, 1906.

Questa Accademia, ch'io ho l'onore di presedere e alla quale comunicai il gentile, particolare invito, ricevuto dalla "American Philosophical Society," di participare alle feste da questa promosse nell'occasione del dugentesimo anniversario della nascita di Beniamino Franklin, vuole le sieno, a uno mezzo, espress' i più sinceri sensi di gratitudine.

Una delle maggiori glorie della nostra Accademia è infatt' quella di poter annoverare tra i suoi soci piu insigni il grande scienziato americano, e però palesa tutta la propria esultanza in una ricorrenza tanto solenne, non solo per gli Stati Uniti d'America, ma anchè per tutto le altre nazioni civile.

La grande distanza che ci separa impedisce così a me come ad altri soci dell'Accademia di venire ad onorare di persona il grande festeggiato: ond' Essa si

rivolge allo stesso presente degno successore del Franklin e lo prega vivamente affinchè voglia rappresentarla alle prossime feste, insieme col chiarissimo professore Simon Newcomb di Baltimore.

Voglia, illustrissimo Signor Presidente, gradire le espressioni della nostra riconoscenza per il favore che noi Le chiediamo e che Ella certo non vorra'negarci, non chè quelle della profonda nostra osservanza.

Il Presidente,
V. POLACCO.
Il Segretario,
A. MEDIN.

ISTITUTO DI ZOOLOGIA E ANATOMIA COMPARATA DELLA R. UNIVERSITÀ DI CAGLIARI

Cagliari, 20 Marzo, 1906.

ILLM. SIGNOR PRESIDENTE,

DELLA "AMERICAN PHILOSOPHICAL SOCIETY,"

Philadelphia.

Ho l'onore di porgere a codesta altissima Società scientifica i più vivi ringraziamenti per l'onorifico e cortese invito alla Celebrazione del secondo centenario della nascita di Beniamino Franklin.

Vorrei anch'io poter unirmi ai miei confratelli americani per tributare tutti gli onori più alti e i più profondi omaggi alla memoria di quel Grande che ad un animo immensamente buono univa le qualità più elevate dell' intelligenza e che, cosa unica più che rara nel mondo, seppe essere grande scienziato, profondo filosofo, eccellente statista e filantropo ammirevole, destando l'ammirazione e l'amore di tutti gli uomini!

Ma l'oceano che divide i due mondi non potra impedire che le menti degli Europei non si uniscano a quelle dei loro Confratelli di America in tale sublime celebrazione!

Il Direttore,

E. GIGLIO-TOS.

L'ACADÉMIE DES SCIENCES DE PARIS

INSTITUT DE FRANCE
ACADÉMIE DES SCIENCES

Paris, le 5 Avril, 1906.

Les Secrétaires perpétuels de l'Académie à Monsieur le Président de L'AMERICAN PHILOSOPHICAL SOCIETY À PHILADELPHIE.

Monsieur le Président:

En invitant l'Académie des Sciences de Paris à se faire représenter aux cérémonies qui se préparent à Philadelphie pour la célébration du deux-centième anniversaire de la naissance de Benjamin Franklin, vous voulez bien rappeler les liens qui unissaient la France et l'Académie au savant illustre, à l'homme éminent et bon dont votre patrie reconnaissante s'apprête à honorer de nouveau le souvenir.

Nous aussi nous concervons précieusement ce souvenir et nous nous rappelons que nos prédécesseurs s'étaiént empressés d'appeler parmi eux celui qui avait arraché à la Nature un de ses plus beaux secrets. La vénération que la France toute entière avait pour lui était telle que lorsqu'il quitta sa retraite de Passy pour aller mourir

à Philadelphie au milieu de ses concitoyens, notre Assemblée Nationale voulut lui rendre un hommage solennel et ordonna un deuil de trois jours en mémoire des services qu'il avait rendus à l'humanité tout entière.

Depuis que, par l'effort de toute sa vie, il a contribué à assurer à votre patrie toute son indépendance et à préparer ainsi les destinées glorieuses auxquelles elle est parvenue, la Science Américaine à pris dans le concert des Nations une place chaque jour plus importante et plus appréciée. L'Académie des Sciences compte aujourd'hui deux Américains parmi ses Associés Etrangers. Elle a pensé qu'en leur confiant la mission de la représenter aux cérémonies de Philadelphie, elle répondrait de la manière la meilleure aux intentions qui lui ont été exprimées. Ils ont reçu comme Franklin le plus grand honneur dont l'Académie puisse disposer: "Toute l'Europe," nous écrivait Franklin le 16 Novembre 1772, "regarde avec justice l'honneur d'être admis au nombre se vos Associés Etrangers comme le plus grand auquel un Savant puisse arriver dans la république des lettres." Cet honneur nous l'avons conféré à MM. Newcomb et Agassiz. Leurs privilèges sont les mêmes que ceux des Membres Ordinaires de l'Académie. Leur présence à Philadelphie aura un double résultat. En même temps qu'elle constituera la meilleure preuve que l'Académie puisse donner de tout l'intérêt que nous

attachons à prendre part à la célébration d'un glorieux anniversaire, elle sera aussi une manifestation éclatante de la haute estime que professent et l'Académie et la France pour la Science et les Savants Américains.

Veuillez agréer, Monsieur le Président, l'assurance de notre haute considération.

Les Secrétaires Perpétuels.

M. BERTHELOT.

G. DARBOUX.

HARVARD UNIVERSITY

HARVARD UNIVERSITY

TO

THE AMERICAN PHILOSOPHICAL SOCIETY.

Greeting:

Harvard University gladly joins the American Philosophical Society in celebrating the Bi-Centennial of its illustrious Founder's birth; for in 1753 the University conferred upon Benjamin Franklin his first academic degree, — the honorary degree of Master of Arts, — in recognition of his remarkable experiments in electricity, by which he had enriched human knowledge and won fame throughout the civilized world.

The establishment of the American Philosophical Society was an expression of Franklin's belief that the advancement of learning was one of the highest concerns of mankind, and that in comparison with it the settling of colonies and the satisfaction of their material wants was, to use his own language, but "drudgery." How closely did this belief resemble that which led, in the preceding century, to the founding of Harvard College, as now recorded on the College walls:

After God had carried us safe to New England
And wee had builded our houses
Provided necessaries for our livelihood
Reard convenient places for Gods worship
And settled the civill government
One of the next things we longed for
And looked after was to advance learning
And perpetuate it to posterity

These two Societies of Scholars being thus bound together by a common interest in the person of Franklin, and by a common devotion to the cause he served, the University now presents its hearty felicitations to the American Philosophical Society and bespeaks for it continued prosperity in the fulfilment of its high purpose.

Given in Cambridge, on the sixteenth day of April, in the year nineteen hundred and six.

THE PRESIDENT AND FELLOWS
OF HARVARD COLLEGE
BY JEROME DAVIS GREENE,
Secretary.

(SEAL)

THE ROYAL SOCIETY

The Royal Society of London for Promoting Natural Knowledge send cordial greetings to The American Philosophical Society held at Philadelphia for Promoting Useful Knowledge on the occasion of the second centenary of the birth of their chief founder and promoter.

Benjamin Franklin was elected a Fellow of the Royal Society by right of birth. His surname alone would mark him for all time as a product of the civic institutions developed by the Anglosaxon race, the common heritage of two hemispheres.

For a long period Franklin took a prominent part in the Royal Society in advancing the aim imposed by their ancient charter, the Promotion of Natural Knowledge, alike by his own weighty and trenchant experiments and insight and by the stimulating correspondence which he carried on with his fellow members. The Royal Society call to mind the early days when the Leyden Phial, then a wonderful novelty, was introduced as a gift from one of their Fellows to the small and unpretending intellectual circle in the remote Colony at Philadelphia; and the remarkable correspondence which soon followed, recounting how the new power

had been probed and illustrated by the Colonial Philosophers in many aspects, with a directness and insight which might in more settled times have given promise of an earlier Faraday. They recall that soon after, in 1753, the Copley Medal was conferred upon Franklin for his achievement in the identification and control of the forces of lightning: that he was elected a Fellow of the Royal Society in 1756, his name by a special resolution being inserted on the register without waiting his attendance for admission, and the customary annual payments of a Fellow being foregone: that he began a period of active administrative connexion by serving on the Council in 1760: that he used his ability and influence to uphold Priestley when in trouble in 1767: that he took a prominent part in the Committees which in 1769 advised on the protection from lightning of St. Paul's Cathedral and the magazines at Purfleet.

When by stress of political disturbance he was called upon to play the part of a citizen in times of danger, by the efficiency and dignity of simple intellect he moved as a power among the controlling social forces of the world. As in another famous case, the fraternity of Science and its aim towards the intellectual development of mankind were hardly allowed to be interrupted by the passion of those discordant activities, against any possible recurrence of which it is now our own duty to provide. Had the intense and steadfast genius of

Franklin and his small band of American Philosophers been permitted to find undisturbed satisfaction in the affairs of the mind, the rise and rapid advance of American Science might have been antedated by a century.

When the silken chain of connexion with the mother country had become hopelessly broken, it was the care of Franklin to foster in the new community those intellectual institutions in which he had detected a potent source of progress and welfare in the older land. The Royal Society are glad to recognize in the Statutes and Regulations which were framed for the American Philosophical Society during the long period of the Presidency of Benjamin Franklin a close affinity to their own ancient Statutes.

By reason of these weighty historical associations the Royal Society take pleasure in offering their felicitations to one of their daughter Societies on the occasion of the bicentenary of an illustrious man whose fame they inherit in common.

Signed and sealed on behalf of the Royal Society
for Promoting Natural Knowledge.

(SEAL) RAYLEIGH,
President.

March 15, 1906.

R. ACCADEMIA DI SCIENZE, LETTERE ED ARTI

R. ACCADEMIA
DI
SCIENZE, LETTERE ED ARTI.

Modena, 15 Febbraio, 1906.

Questa R. Accademia ha sommamente gradito l'invito della Società filosofica Americana di Filadelfia di prender parte alla solenne celebrazione del secondo centenario dalla nascita di BENIAMINO FRANKLIN: ed è con molto rincrescimento che dobbiamo dichiarare di non poter corrispondere a tanta cortesia.

Niuno di noi per particolari occupazioni e per la distanza de' luoghi puè recarsi costà.

Ci piace nondimeno assicurarvi che col nostro pensiero savemo presenti alle feste che codesta Società ha indetto nel prossimo venturo mese d'aprile per commemorare il grande Filosofo e fautore dell' Indipendenza degli Stati Uniti d'America Beniamino Franklin, nome tanto noto e caro agli Italiani.

Il Presidente,
GENERALI.

Alla Società Filosofica,
Americana,
Filadelfia.

DIE KAISERLICH LEOPOLDINISCH-CAROLINISCH DEUTSCHE AKADEMIE DER NATURFORSCHER

DER SEHR GEEHRTEN
AMERICAN PHILOSOPHICAL SOCIETY
DER ALTESTEN WISSENSCHAFTLICHEN GESELLSCHAFT
AMERIKAS SENDET
DIE KAISERLICH LEOPOLDINISCH-CAROLINISCH DEUTSCHE AKADEMIE DER NATURFORSCHER,
DIE ALTESTE DEUTSCHE AKADEMIE,
ZUR ZWEIHUNDERTJAHRESFEIER VON
BENJAMIN FRANKLIN
DIE HERZLICHSTEN GLÜCKWUNSCHE.

Unsre Akademie verehrt in Franklin vor allem den hervorragenden Forscher, dem es als Erstem gelungen ist, den elektrischen Funken zu meistern, und der sich durch die Erfindung des Blitzableiters nicht allein um die Wissenschaft, nein, um die ganze Menschheit ein unsterbliches Verdienst erworben hat. Doch nicht nur dem Gelehrten gilt unsre Verehrung, sondern auch dem Patrioten und Staatsmann, der an der Befreiung seines Vaterlandes einen so hervorra-

genden Anteil genommen und wesentlich dazu beigetragen hat, dass die einst wenig bedeutende Kolonie zu einem der machtigsten Staatengebilde des Erdrundes emporgediehen ist Nicht minder hoch schatzen wir Franklin als Menschen und Philanthropen. Wir bewundern ihn als einen der Wenigen, denen es gelungen ist, sich lediglich durch eigne Kraft aus niederem Stande zu einer Leuchte der Menschheit emporzuschwingen, als einen Mann, der wurdig ist, in jeder Beziehung der Nachwelt als ein der Nacheiferung wertes Beispiel hingestellt zu werden. Sein Leben ist ein Beweis dafur, dafs zum Talent sich auch nie ermudender Fleiss und Willenskraft gesellen mussen, wenn grosse Dinge vollbracht werden sollen. Wahrlich, die American Philosophical Society kann mit Recht stolz auf diesen ihren Grunder sein.

Gestatten Sie uns, diesen Worten der Bewunderung fur den Mann, dem Ihre Feier vom 17–20. April d. J. gilt, unsre aufrichtigsten Wunsche fur das fernere Bluhen und Gedeihen Ihrer Gesellschaft hinzuzufugen.

Halle a. S., den 5 April 1906.

Der Prasident der Kaiserl. Leopold-Carol. Deutschen Akademie der Naturforscher.

DR. A. WANGERIN.

THE UNIVERSITY OF LUND

TO

THE AMERICAN PHILOSOPHICAL SOCIETY

PHILADELPHIA.

The University of Lund acknowledges the honour of having received the invitation to partake in the celebration of the Two Hundredth Anniversary of the birth of

BENJAMIN FRANKLIN.

We are persuaded that congratulations will arrive from all parts of the world and we are glad to join in the expressions of the feelings of all mankind not forgetting our special national pride of having founded a civilizing work on the shores of Delaware — a work afterwards continued with such glory and success by Philadelphia, the town of William Penn and Benjamin Franklin.

With best regards and sympathy.

SEVED RIBBING,
Rector.

Lund, March the 26th, 1906.

YALE UNIVERSITY

TO

THE AMERICAN PHILOSOPHICAL SOCIETY,

which from the very first has taken the lead in all matters relating to the advancement of science in both hemispheres,

YALE UNIVERSITY

sends its cordial greetings on the occasion of the Franklin Bicentenary.

More than a century and a half has elapsed since Yale College had the privilege of enrolling Benjamin Franklin in the list of its honorary graduates. We are glad to think that the subsequent tributes accorded him by older universities did not dim the memory of that which he received so early in his career. We on our part have never ceased to be proud to have on our rolls the name of one who not only made great discoveries and directed large affairs, but also by his profound study of Nature's laws was able to simplify our conceptions of physical phenomena.

Given at New Haven, Connecticut, on the sixteenth day of April, in the year of our Lord nineteen hundred and six.

ARTHUR TWINING HADLEY.
LEE MCCLUNG.
(SEAL)

KONGLIGA VETENSKAPS-SOCIETEN

SOCIETATI PHILOSOPHÆ
PHILADELPHIENSI
S. P. D.
REGIA SOCIETAS SCIENTIARUM
UPSALIENSIS.

Quod Vos, Viri Clarissimi perhumaniter nos invitastis, ut ad sollemnia bisaecularia, quibus proximo mense

BENJAMIN FRANKLINI

natalem celebraturi estis, Vobiscum obeunda aliquem e coetu nostro legaremus, gratias Vobis quam maximas agimus. Cui voluntati Vestrae nobis tam honorificae, si tempora rerumque nostrarum rationes id paterentur, libenti animo obsequeremur. Nunc vero, quominus id faciamus, non modo itineris longinquitate, sed etiam variis sociorum nostrorum occupationibus prohibemur. Itaque nihil relinquitur, nisi ut, quae coram eloqui non licebit, hac qualicunque epistula significemus.

Ac ne in rebus, quae nullo verborum egent ornatu, praedicandis longiores simus, hoc Vobis gratulamur, quod immortale illud populi Americani decus, BENJAMIN FRANKLINUM, libertatis vindicem constantis-

simum, consiliorum publicorum moderatorem prudentissimum, naturae investigatorem sagacissimum artiumque bonarum omnium patronum sapientissimum, sodalicii Vestri auctorem ferre Vobis licet. Qua cum laude haec non minor coniuncta est, quod Societas Vestra, cum per amplium iam temporis spatium ea studia, quae ad rerum naturam in dagandam hominumque vitam utilibus inventis excolendam pertinent, strenue insignique cum fructu adiuvaret et promoveret, dignam se tali parente alumnan praestitit. Quare, sicut Summi illius Viri memoriam, quamvis magno terrarum mariumque intervallo diiuncti, Vobiscum veneramur, ita festum, quod paratis, optimis prosequimur omnibus Societatique Vestrae omnia in posterum laeta, fausta, felicia optamus et precamur. Valete.

Dabamus Upsaliae m. Martio. a. MDCCCCVI.

Regiae Societatis Scientiarum Upsaliensis nomine

O. A. DANIELSSON,
Praeses.

N. C. DUNER,
A Secretis.

PRINCETON UNIVERSITY

PRAESES, CURATORES, PROFESSORES
VNIVERSITATIS PRINCETONIENSIS
VIRIS ILLVSTRISSIMIS DOCTISSIMIS
PRAESIDI ET SODALIBVS
SOCIETATIS PHILOSOPHICAE AMERICANAE
S. P. D.

Patres et conditores amplissimae hvivs reipvblicae nihil antiqvivs habvervnt qvam vt advlescentes nostri ad omnem hvmanitatem informarentvr quo meliores evaderent cives, ac sibi et reipvblicae honori et emolvmento esse possent. Inter eos qvi, civitatis fvndamentis vix iactis scientiarvm sedes constitvervnt, praecipvvm tenvit ac tenet locvm praeclarrimvs ille vir

BENJAMIN FRANKLIN

ex qvo nato annvm dvcentesimvm iam exactvm, feriis saecvlaribvs, proximo mense celebratvri estis. Plvrima qvidem stvdiosorvm hominvm inter se commvnia svnt: aeqvi veriqve inqvisitio, docendi discendique libertas, volvntatvm consiliorvmqve consensio, clarorvm libera-

livmqve virorvm memoria. Nos ergo in Avla Nassovica commorantes maxime decet illivs colere memoriam

Patriae amatoris
Libertatis avctoris
Scientiae favtoris

Qvapropter volvntati vestrae libentes obsecvti vicarios delegavimvs viros praestantes Gvlielmvm Berryman Scott, Geologiae Professorem, et Gvlielmvm Franciscvm Magie, Physicae Professorem, nec non secretarium academici ordinis nostri, quorvm alter consangvinitate, alter affinitate Franklin illi magno est conivnctus, vt benigno hospitio accepti salvtem vobis impertiant plvrimam et plenissimam. Valete.

WOODROW WILSON,
Praeses.

Dabamvs in Avla Nassovica
Vniversitatis Princetoniensis
in Repvblica NeoCaesariensi
A.D. XIV. Kal. Apr. MCMVI.

L'ACÁDEMIE DES SCIENCES, INSCRIPTIONS ET BELLES-LETTRES DE TOULOUSE

ADRESSE VOTÉE PAR L'ACADEMIE DES SCIENCES, INSCRIPTIONS ET BELLES-LETTRES DE TOULOUSE À L'OCCASION DE LA CÉLÉBRATION DU DEUXIÈME CENTENAIRE DE LA NAISSANCE DE BENJAMIN FRANKLIN.

Les Académies provinciales françaises, qui jouèrent vers 1750 un si grand rôle pour la diffusion, la vulgarisation et la vérification des idées géniales de Benjamin Franklin sur l'Electricité, ne sauraient rester indifférentes à la célébration du deuxième centenaire de la naissance de l'illustre savant.

A ce titre, l'Académie des Sciences, Inscriptions et Belles-Lettres de Toulouse est qualifiée pour exprimer à la Société philosophique américaine toute la part qu'elle prend à la manifestation des 17, 18, 19 et 20 Avril, 1906.

L'impossibilité matérielle ou l'Académie s'est trouvée de se faire représenter par un de ses membres aux fêtes mémorables qui se préparent en l'honneur du grand citoyen de Boston, n'affaiblit en rien l'enthousiasme

qu'elle ressent pour l'oeuvre émancipatrice à laquelle Franklin a attaché son nom et qui n'a d'égal que l'admiration qu'elle professe pour son oeuvre scientifique.

Peu d'hommes ont eu, à un degré aussi éminent, la passion de la patrie et celle de la science; c'est pourquoi, dans tous les temps, le nom de Franklin s'élèvera au-dessus de beaucoup d'autres.

L'Académie des Sciences, Inscriptions et Belles-Lettres de Toulouse ne peut oublier que la personne de Franklin était à elle seule, autrefois, un trait d'union entre la France et les Etats-Unis; elle souhaite que son grand nom continue de cimenter dans l'avenir l'amitié des deux grands peuples comme il l'a fait dans le passé.

Honneur à Benjamin Franklin!

Honneur aux nations qui immortalisent le souvenir de leurs illustres enfants!

Toulouse, le 6 Avril, 1906,
Pr Le Secrétaire perpetuel,
Le Secrétaire adjoint,
G. MATHIAS.

COLUMBIA UNIVERSITY

COLUMBIA UNIVERSITY

PRESENTS GREETINGS AND CONGRATULATIONS TO THE

AMERICAN PHILOSOPHICAL SOCIETY

upon the Two Hundredth Anniversary of the Birth of the Founder of the Society.

Recognizing the eminent services of

BENJAMIN FRANKLIN

to the advancement of education the encouragement of Scientific research and the cultivation of higher thought it is but fitting that this occasion should be honored by all institutions of learning and more especially by the University which has succeeded the College founded and first presided over by Samuel Johnson the contemporary and friend of Franklin. King's College and the American Philosophical Society coming into existence almost simultaneously were alike imbued with a broad and philosophic conception of their obligation to contribute toward the enlightenment of the new world.

The Society in cherishing the sacred flame which was lighted upon its altar by its Founder has most worthily perpetuated his memory and in respectful appreciation

of the results which the Society throughout its long and distinguished history has accomplished towards the advancement of philosophy and science and towards the attainment of the noble ideals for which it was established the University offers its cordial felicitations.

IN WITNESS WHEREOF the Trustees of Columbia College in the City of New York have caused these presents to be executed and their corporate seal to be affixed the seventeenth day of April in the year of our Lord one thousand nine hundred and six.

(SEAL)

NICHOLAS MURRAY BUTLER,
President.

G. L. RIVES,
Chairman.

JOHN B. PINE,
Clerk.

BATAAFSCH GENOOTSCHAP DER PROEFONDERVINDELIJKE WIJSBEGEERTE

(SEAL) ROTTERDAM, February, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY HELD AT PHILADELPHIA, FOR PROMOTING USEFUL KNOWLEDGE.

The "Bataafsch Genootschap der Proefondervindelijke Wijsbegeerte" at Rotterdam is happy in having the opportunity of congratulating your Society on the memorable Celebration of the Two Hundredth Anniversary of the birth of Benjamin Franklin, the founder of your Society.

It would not suit our purpose to dwell upon his great merits in the domain of physical and political science.

It may be sufficient to declare that our Society feels most honoured, that Benjamin Franklin belonged to its first members, and acknowledges with gratitude, that his glory has favoured the rise of the "Bataafsch Genootschap"

The Direction of the "Bataafsch Genootschap"

Praeses Magnificus,
F. B. S'JACOB.

First Secretary,
DR. G. J. W. BREMER.

THE AMERICAN ACADEMY OF ARTS AND SCIENCES

TO THE

AMERICAN PHILOSOPHICAL SOCIETY

A GREETING FROM THE

AMERICAN ACADEMY OF ARTS AND SCIENCES.

On this memorable day, when the oldest learned society in the United States is celebrating with due honor the two hundredth anniversary of the birth of her illustrious Founder, her next younger sister, The American Academy of Arts and Sciences, feels pride and pleasure in offering to her most respectful congratulations and most affectionate greetings. Our delegates are in doubt whether they should congratulate the Philosophical Society more heartily on her venerable age and her distinguished service of one hundred and sixty-three years in the cause of learning, or on the vigorous activity in which she now appears before them "flourishing in an immortal youth." In her present freshness we see the perennial youth of her great Founder, who was never more thoroughly alive and never more devotedly enshrined in the hearts of his countrymen than he is on this two-hundredth anniversary

of his birth. And we fervently hope that this society, one of his first and greatest memorials, may long survive to give ever fresh dignity to his illustrious name.

The American Academy was founded in 1780, thirty-seven years later than your society. These venerable associations, which saw the nation established and helped in no small measure in its establishment, have always striven to be national in their character. Though the men who were incorporated as the American Academy in 1780 were all citizens of Massachusetts, among them being John Adams, Samuel Adams, and John Hancock, in less than nine months we find on its roll Benjamin Franklin of Philadelphia, and George Washington of Mt. Vernon, Virginia; and not much later Thomas Jefferson, Benjamin Rush, John Jay, Alexander Hamilton, and James Madison, all as ordinary members, with full rights and privileges. Both John Adams and John Quincy Adams retained the presidency of the Academy while they held the presidency of the United States.

We feel that we cannot better express the high regard in which our Academy holds the Philosophical Society than by repeating the words with which the late Hon. Robert C. Winthrop, the orator of the Academy on its hundredth anniversary in 1880, greeted the delegates of this Society. After alluding to the Old South Meeting house in Boston, in which he was speaking, as the place where the infant child of an humble tallow-

chandler, who was brought in a blanket from his parent's house just across the street on the very day of his birth, January 6, 1706, received from the pastor's lips the name of Benjamin Franklin, Mr. Winthrop thus spoke:—

"We may not forget that, while the history of American Arts and Sciences may fairly begin with our Boston-born apprentice, that history must turn to another city and another state for the opening pages of its earliest chapter. Old as we are, we cannot claim the distinction of being the oldest of American scientific associations; and we are rejoiced to recognize and to welcome among our guests to-day a distinguished delegation from our elder sister, the American Philosophical Society of Philadelphia, which was founded by Franklin not a great many years after he had run away, as a lad of seventeen, from his apprenticeship and indentures here, and had established himself in the City of Brotherly Love. That noble city has a heritage of historic glory, which may well be the admiration, if not the envy, of all other American cities. But it is as the acknowledged birthplace of the first American philosophical Society that we hail it especially on this occasion, and welcome the delegates from that city and from that Society with an exceptional emphasis and fervor. We welcome, indeed, most heartily on this occasion every one of the delegates who have honored us by their presence

from other cities and states; but they will pardon us, I am sure, for confining our first individual recognition, here and now, to the parent Philosophical Society of Philadelphia."

WILLIAM W. GOODWIN, President.

(SEAL) W. M. DAVIS.

Boston, April 17, 1906.

MANCHESTER
LITERARY AND PHILOSOPHICAL SOCIETY

TO THE AMERICAN PHILOSOPHICAL SOCIETY.

The Manchester Literary and Philosophical Society sends greetings to its sister The American Philosophical Society for Promoting Useful Knowledge on the occasion of the Two Hundredth Anniversary of the birth of its founder, Benjamin Franklin.

As a philosopher, statesman, and diplomatist, and as a pioneer in the scientific fields of capillarity, acoustics, electricity and meteorology, Dr. Franklin will long be remembered, and his intimate association with your Society is a circumstance of which you may be justly proud.

W. H. BAILEY, K.B.,
President.

FRANCIS JONES,
CHARLES H. LEES,
Hon. Secretaries.

April 6th, 1906.

REGIA SOCIETAS SCIENTIARUM BOHEMICA

REGIA
SOCIETAS SCIENTIARUM BOHEMICA
ROYAL, 562–1.

Prague, March 30th, 1906.

The Royal Bohemian Society of Sciences begs to acknowledge with many thanks the kind invitation of the American Philosophical Society of Philadelphia to the celebration of the two-hundredth anniversary of Benjamin Franklin's birth.

Fully appreciating all the deserts of the Great Man whose memory the American Philosophical Society is going to honour, we regret deeply that none of our members are able at this time of the year to take part in the festivities personally. Still the Royal Bohemian Society of Sciences has, in ordinary meeting on the 7th inst., resolved unanimously to express our warmest sympathy, and to add our heartfelt wishes that it may be granted to the American Philosophical Society to celebrate many happy centennial returns of this solemn festivity.

For the Royal Bohemian Society of Sciences:

PROF. DR. V. E. MOUREK,
General Secretary.

(SEAL)

THE UNIVERSITY OF THE STATE OF NEW YORK

(SEAL)

THE UNIVERSITY OF THE
STATE OF NEW YORK,
FOUNDED 1784

ACCEPTS WITH PLEASURE THE CORDIAL INVITATION OF
THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA
FOR PROMOTING USEFUL KNOWLEDGE
TO ASSIST IN THE CELEBRATION OF THE TWO
HUNDREDTH ANNIVERSARY OF THE BIRTH OF
BENJAMIN FRANKLIN.

The achievements of the Founder of the American Philosophical Society, always highly appreciated by the rest of the world, are receiving to-day from his own countrymen greater evidences of his skill as a diplomatist, and his services as a patriot which hitherto had been limited more to his scientific attainments.

To convey properly its salutations to the American Philosophical Society the University delegates

REGENT T. GUILFORD SMITH

to be present at Philadelphia on the days appointed for the ceremonies to join with other institutions of learning in this well deserved celebration.

(SEAL) ST. CLAIR MCKELWAY,
Vice Chancellor.

THE ROYAL INSTITUTION OF GREAT BRITAIN

THE ROYAL INSTITUTION OF GREAT BRITAIN
WHICH CELEBRATED ITS CENTENARY IN
THE YEAR 1899, DESIRES TO OFFER TO THE
AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA FOR PROMOTING USEFUL
KNOWLEDGE,
ITS CONGRATULATIONS ON THE OCCASION OF THE
CELEBRATION OF THE
TWO HUNDREDTH ANNIVERSARY OF THE BIRTH OF ITS
FOUNDER—
BENJAMIN FRANKLIN.

The Royal Institution of Great Britain, having for its primary objects the prosecution of Scientific Research and the illustration and diffusion of the Principles of Inductive and Experimental Science, recognizes with sympathy and admiration the work done by the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge and recalls with interest and respect the Scientific and Experimental Investigations of Benjamin Franklin and their practical utility to mankind; and desires to express its recognition of the services rendered by this distinguished citizen, philosopher, and statesman.

NORTHUMBERLAND.

THE ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW

The Royal Philosophical Society of Glasgow sends heartiest congratulations to the American Philosophical Society, held at Philadelphia, for Promoting Useful Knowledge, on attaining in prosperity and much success an epoch in its history so memorable as the two-hundredth anniversary of the birth of its illustrious Founder, Benjamin Franklin.

It rejoices at the opportunity which enables it to take part in doing honour to the memory of this truly great man; great in every relation of life; great in every department of knowledge that he cultivated, not less than in the issue of all his undertakings; and recognizes in the institution of the American Philosophical Society one of his invaluable and enduring services to America and to mankind.

It is with feelings of admiration that the Royal Philosophical Society of Glasgow looks back upon the splendid history of the American Philosophical Society, and sees how the genius and enthusiasm of its Members bore it through all difficulties and enabled it to emerge with added vigour to carry on its beneficent mission; and

marks the parallel with the vicissitudes in the career of Franklin himself.

The Royal Philosophical Society of Glasgow desires to testify how amply and nobly the American Philosophical Society has fulfilled the design of its Founder, and how great is the debt which the cause of knowledge owes to its zeal in the encouragement of research, and to its efforts in the dissemination of information by its publications; and desires also to express the earnest hope that it may long maintain its place as the oldest scientific institution in the UNITED STATES OF AMERICA; and that the fair promise of its past may be realized in a future of even greater prosperity and renown.

Given under the seal and in name of the Royal Philosophical Society of Glasgow this 4th day of April, nineteen hundred and six.

(SEAL)

DAVID MURRAY,
M.A., LL.D., F.S.A.
President.

UNIVERSITÉ DE LYON

(SEAL)

Messieurs:

L'Université de Lyon tient à honneur d'avoir été invitée par la Société philosophique américaine de Philadelphie à célébrer le deuxième centenaire de la naissance de Franklin. Elle aurait été heureuse de pouvoir déléguer l'un de ses membres à cette pieuse et grandiose cérémonie. Nous aurions voulu que notre hommage fût traduit de vive voix, au milieu de l'éclat de vos fêtes; vous auriez senti plus présente, si non plus sincère, la sympathie dont nous vous prions de trouver ici l'expression.

Car votre illustre fondateur nous est cher à plus d'un titre. Nous savons ce que lui doit la science, et comment se sont unis en lui pour le service de l'humanité le génie de la découverte et le génie de l'invention. Épris de science pure et toute bienfaisante, non de succès personnel, il ne discuta jamais pour défendre ses opinions scientifiques "si elles sont justes, disait-il, la vérité et l'expérience les soutiendront; si elles sont fausses, il est bon qu'on les réfute."

Nous admirons le zèle qu'il a déployé toute sa vie pour développer l'enseignement du peuple, pour fonder

des écoles et des bibliothèques, pour répandre le bienfait de sa propre expérience et le secret de ses vertus. Mais nous admirons surtout l'ardeur qui l'a porté, à travers tant d'obstacles, vers les hautes études scientifiques. S'il écrivit et publia bien avant l'âge où l'on devient étudiant, il se fit étudiant à 40 ans passés. Il dut à sa volonté autant qu'à son génie de devenir bientot un maître, de mériter les honneurs universitaires sans avoir jamais étudié dans aucun collège. C'est pour nous et pour les jeunes gens dont nous avons à diriger l'effort vers la science le plus précieux enseignement, la plus grande leçon que nous devions retenir de cette belle vie.

Ces sentiments, Messieurs, sont ceux qui unissent dans le monde entier sur le nom de Franklin tous les amis de la science. Mais notre pays en ressent l'émotion avec une particulière sympathie. Notre pensée aime à revivre le temps où votre glorieux concitoyen était accueilli chez nous avec enthousiasme par une foule "dont les rangs s'ouvraient respectueusement devant lui." Nous aimons à nous souvenir aussi qu'il a dit de la France qu' "elle possède au plus haut degré, par dessus toutes les nations de la terre, l'art de se faire aimer des étrangers."

Enfin, notre Université lyonnaise a d'autres raisons encore pour honorer la mémoire de Franklin. S'il n'est pas venu jusqu'à Lyon, il a entretenu une correspondance suivie avec un de nos compatriotes qui est devenu son ami, à qui il suggéra mais de qui il reçut aussi des idées

pour des fondations utiles au bien public. Son attention fut attirée par le renom d'une Societé savante où nous pourons reconnaître, comme l'Université de Philadelphie reconnait son passé dans celui de votre Société, une première ébauche de notre Université. Et il accepta ou plutôt souhaita d'être membre associé de l'Académie de Lyon qui l'élut en sa séance du 31 Mai, 1785.

Vous nous permettrez donc de dire, Messieurs, que tous ces souvenirs nous associent de plus près et plus intimément à votre pensée. L'Université de Lyon se plaît à les rappeler aujourd'hui, en offrant son tribut d'hommages à la mémoire du fondateur de votre illustre Compagnie, du grand savant, du grand citoyen en qui l'humanité reconnaît un de ses bienfaiteurs, une de ses gloires les plus pures.

Le Recteur, Président du Conseil de l'Université de Lyon,

ROUBIN.

Avril, 1906.

PHYSIKALISCH-MEDICINISCHE SOCIETÄT ZU ERLANGEN

PHYSIKALISCH-MEDICINISCHE
SOCIETAT ZU ERLANGEN.

Erlangen, den 18 März, 1906.

Der American Philosophical Society habe ich die Ehre im Auftrag unserer Societät den verbindlichsten Dank für die freundliche Einladung zur zweihundertjährigen Geburtsfeier Benjamin Franklins, des grossen Menschen, Forschers und Staats-mannes, zu übermitteln. Leider ist es uns nicht möglich durch einen Delegierten uns an der Feier zu beteiligen, wie wir gehofft hatten, aber im Geiste werden wir an der Feier teilnehmen, wie es die ganze nicht nur gelehrte sondern überhaupt gebildete Menschheit diesem grossen vorbildlichen Manne schuldig ist.

In vorzüglicher Hochachtung
ganz ergebenst
der derztge I. Sekretär,
PROF. D. A. SPULER.

IMPERATORSKIJ S. PETERBURSKIJ UNIVERSITET

THE IMPERIAL ST. PETERSBURG UNIVERSITY COUNCIL
SENDS GREETING TO
THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA
FOR PROMOTING USEFUL KNOWLEDGE.

On the occasion of the Two Hundredth Anniversary of the birth of the famous public worker, true patriot and great scholar, Benjamin Franklin, who gave mankind a weapon of defence against the formidable force of Nature — lightning, and by his remarkable researches greatly advanced the study of electric phenomena. The name of Franklin will remain memorable for ever. Long may the Philosophical Society founded by Franklin likewise flourish and prosper.

I. BORGMANN, Rector,
J. WRAM, Dean,
V. SHEHOUSKI,
W. SCHIMKEWITSCH,
W. SERGIEVIC.

THE ROYAL ASTRONOMICAL SOCIETY

We, the President and Fellows of the Royal Astronomical Society send greeting to the American Philosophical Society on the occasion of the two hundredth anniversary of the birth of its founder and first President, the illustrious philosopher Benjamin Franklin.

We offer our grateful thanks for the courtesy which has permitted us to share in honouring one whose gifts and labours have called forth the admiration of mankind.

Especially would we remember the brilliant discoveries which established the identity of the electric discharges of the atmosphere with those of the laboratory; which may justly be regarded as the beginning of that science which to-day unites the most distant and majestic phenomena of the Universe in the bonds of physical identity.

We pray a long and prosperous continuance to the Society whose foundation rests in such splendid associations, and whose work has for so long contributed to the advancement of knowledge.

Signed and sealed at the Apartments of the Society, the ninth day of March, one thousand nine hundred and six.

Burlington House, London.

W. H. MAW,
President.

(SEAL)

THOMAS LEWIS,
Secretary.

THE ROYAL SCOTTISH SOCIETY OF ARTS

(SEAL)

117 George Street,
EDINBURGH, 4th April, 1906.

To The American Philosophical Society:

The Royal Scottish Society of Arts is honoured by the invitation of the American Philosophical Society, to be represented at the 200th anniversary of the birth of Benjamin Franklin. The name of Franklin is, with reason, respected wherever the light of Science has reached, and we in Scotland are second to none in our veneration for the memory of the illustrious Founder of your Society.

The foundation of a structure is a measure of its strength; and to the fact, that your Society was founded by one who was not less remarkable for the notability of his character, and for his work as a citizen, than for his distinction as a Scientist, may largely be due the success which the American Philosophical Society has had in the promotion of knowledge. That your Society may long continue its noble work, fortified by the memory of the good works of Franklin its Founder, and those who have followed in his steps, is our earnest hope.

Signed in name of and on behalf of the Royal Scottish Society of Arts by

T. HUDSON BEARE,
President.

WM. ALLAN CARTER,
Secretary.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

(SEAL)

WE, THE PRESIDENT AND COUNCIL OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,

HOLD THAT YOU, THE

President and Fellows of the American Philosophical Society, do well to clebrate the two hundredth anniversary of the birth of

BENJAMIN FRANKLIN

For the commemorations of great men serve, as it were, to mark the rungs in the ladder of progress up which mankind has climbed; and, further, such ceremonies can hardly fail to point out to us, the living generation, how earnestly we must strive if we would prove ourselves worthy descendants of our great predecessors.

ALTHOUGH Franklin was equally great as a Statesman and as an Investigator of Nature, we take it that it is as a Discoverer, rather than as one of the Founders of the American Commonwealth, that you now recall his fame.

SCIENCE knows neither frontier nor nationality; and therefore it is fitting that the memory of one of the greatest of men of science should be celebrated at an international gathering.

EVERY nation is, however, proud of its achievements in letters and science; and so we cannot forbear from claiming our share in the fame of Franklin: for we recall that he was of English parentage, and did not cease to be a citizen of our Empire until he had attained the age of seventy years.

OUR Societies possess a common bond in that we are both banded together for the promotion of Natural knowledge; and we thank you for giving us the opportunity of taking part in your festival.

MAY your Society long continue to be in the future, as it has been in the past, worthy of its illustrious founder.

SIGNED, on behalf of the Council,

G. H. DARWIN,

President of the British Association.

NATURFORSCHENDE GESELLSCHAFT, FREIBURG I. BREISGAU

AN DEN VORSTAND DER
AMERICAN PHILOSOPHICAL SOCIETY

Freiburg B. 21. 11. 06.

Philadelphia

Sehr geehrte Herren!

Für die gütige Einladung zur Franklin—Feier sage ich Ihnen im Namen unserer Gesellschaft verbindlichsten Dank; wir nehmen an Ihrem Ehrentage lebhaften Anteil & begrüssen Sie als Schwestergesellschaft am Geburtstage des Mannes, den sein Geist als den unseren ebenso werden liess, wie er der Ihrige ist.

Trotz dieser unserer herzlichen & freudigen Teilnahme ist es leide bei der grossen Entfernung nicht möglich, dass einer von uns persönlich zu Ihrer Feier erscheine, wir bedauern das ganz ausserordentlich & bitten Sie, es zu entschuldigen.

Aber wir wollen es uns nicht nehmen lassen, Ihnen eine *Adresse* zu übersenden & bitten Sie dieselbe Ihrer Sitzung zur Verlesung zu bringen.

Mit vorzüglicher Hochachtung

Ihr sehr ergebener,
DR. MED. E. FISCHER,
Prof. d. Anatomie,
Schriftführer der Naturforschenden Gesellschaft.

KONGELIGE NORDISKE OLDSKRIFT SELSKAB

THE AMERICAN PHILOSOPHICAL SOCIETY AT PHILADELPHIA.

The Royal Society of Northern Antiquaries has the Honour of expressing their sympathy on the occasion of the 200th birthday of

BENJAMIN FRANKLIN.

Together with the whole learned world, we bow ourselves in deep veneration to the memory of this great citizen of the world, the promoter of civilization and science.

To The American Philosophical Society, which is justly proud of calling BENJAMIN FRANKLIN its founder, we send a brotherly greeting and our sincere appreciation of the connection throughout a hundred years.

THE ROYAL SOCIETY OF NORTHERN ANTIQUARIES.

Copenhagen, March, 1906.

E. HOLM, Vice-President.

SOPHUS MÜLLER, Secretary.

MAGYAR TUDOMÁNYOS AKADÉMIA

MAGYAR TUDOMÁNYOS AKADÉMIA.

Budapest, February 19, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,

Philadelphia.

In answer to your kind invitation to attend the celebration of the Two Hundredth Anniversary of the birth of your illustrious founder, I beg to thank you, in the name of the Magyar Tudományos Akadémia, for the same, and to inform you that the General Meeting of our Academy held on Jan. 29th last, instructed me to assure you of our feeling of admiration and reverence for the immortal Franklin, a feeling shared by all civilized nations and to send you on this occasion our heartiest greetings.

Yours faithfully,

HEINRICH,

General-Secretary.

THE CONNECTICUT HISTORICAL SOCIETY

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
COMMEMORATING THE TWO-HUNDREDTH ANNIVERSARY
OF THE BIRTH OF ITS FOUNDER, APRIL 1906.

Gentlemen:

The Connecticut Historical Society has done me, as its President, the honor of designating me to represent it, in accordance with your kind invitation, at the commemorative exercises of this week; and as I am prevented from attending until the closing days, I desire to offer you our congratulations in written words.

That which has been accomplished by your Society in more than eight score years of honored history might well call for recognition from any who at all know the value of such work as that to which you are devoted and its influence on the intellectual and moral progress of our land; but you are rightly seeking now "consecrare origines et ad deos referre auctoris." And if the historian of Rome could claim that her annals would justify her in making any assertion whatever as to the dignity of her foundation, we cannot be amiss in confessing that you are worthy to have had Franklin for your founder and that in celebrating his birth you are honoring both

him and yourselves. We wish for you in the future labors and success surpassing those of the past and such as shall add new lustre to the distinguished name beneath which your history shall continue to be written.

And I have the honor to be,

Very truly yours,

SAMUEL HART.

THE UNIVERSITY OF TORONTO

(Coat of Arms)

The University of Toronto sends
greetings and congratulations to
The American Philosophical Society
on the occasion of the Celebration of the Two
Hundredth
Anniversary of the Birth of its Founder
Benjamin Franklin.

Whilst expressing unreserved admiration for the eminent services rendered by Benjamin Franklin to his country as citizen, statesman and diplomatist, the University of Toronto desires more especially to join with others in honouring his memory as a distinguished pioneer in the field of American scientific discovery, and as a founder and organizer of institutions for the promotion of learning and the advancement of science.

J. Loudon,
President.

W. R. Meredith,
Chancellor.

James Brebner, (Seal)
Registrar.

Charles Moss,
Vice-Chancellor.

University of Toronto, 10 April, 1906.

THE ROYAL GEOGRAPHICAL SOCIETY

FROM THE PRESIDENT
THE RIGHT HON. SIR GEORGE TAUBMAN GOLDIE,
K.C.M.G., F.R.S.,
AND COUNCIL OF THE
ROYAL GEOGRAPHICAL SOCIETY
TO THE
AMERICAN PHILOSOPHICAL SOCIETY.

The President and Council of the Royal Geographical Society, on behalf of the Fellows, desire to convey to the American Philosophical Society their warmest congratulations on the occasion of the celebration of the 200th Anniversary of the birth of its Founder,

BENJAMIN FRANKLIN

who attained distinction in so many directions. It is a remarkable feature in the history of the great country, which afterwards became the UNITED STATES OF AMERICA, that so early in its career, the value of Science and of Research should have been recognized by the founda-

tion of a Society which has done so much for the promotion of KNOWLEDGE.

THE AMERICAN PHILOSOPHICAL SOCIETY

has for long maintained a position on a level with the Great Scientific Societies of the World, and its series of publications, as well known in Europe as in America, fully justify that position.

The President and Council of the Royal Geographical Society feel confident that the same high standard will be maintained by their Sister Society in Philadelphia in the future as in the past, and they desire to assure the Society of their cordial good wishes for its prosperity and success.

On behalf of the Council and Fellows of the

ROYAL GEOGRAPHICAL SOCIETY,

GEORGE TAUBMAN GOLDIE,

London, President.

March 12, 1906.

VEREIN FÜR VATERLANDISCHE NATURKUNDE IN WÜRTTEMBERG

Stuttgart, den 20 Februar, 1906.

DER AMERICAN PHILOSOPHICAL SOCIETY

ZU PHILADELPHIA.

BEEHRT SICH DER

VEREIN FUR VATERLANDISCHE NATURKUNDE IN WÜRTTEMBERG

zu der am 17 bis 20 April d. Js. bevorstehenden Feier der 200 sten Wiederkehr des Geburtstags von

BENJAMIN FRANKLIN

den Ausdruck der Teilnahme der Mitglieder des Vereins an dieser bedeutsamen Feier darzubringen.

Der grosse Staatsmann und Naturforscher gehört nicht nur durch die Höhe seiner Gesellschaft und Natur umfassenden Weisheit zu den hervorragendsten Vertretern des menschlichen Geschlechts, er ist vor Allem als sittliche Persönlichkeit ein leuchtendes Vorbild der Jugend, in dessen Verehrung unter den Nationen der

Erde nicht als letzte die deutsche sich mit der grossen Nation, welche Benjamin Franklin hervorgebracht hat, verbunden weiss.

Im Namen des Vereins für vaterländische Naturkunde.

Der derzeitige Vorstand:

DR. A. SCHMIDT,
Geh. Hofrat.

THE SMITHSONIAN INSTITUTION

SMITHSONIAN INSTITUTION

PRESIDING OFFICER

EX-OFFICIO

THE PRESIDENT OF THE UNITED STATES

CHANCELLOR

THE CHIEF JUSTICE OF THE UNITED STATES

Washington, April 13, 1906.

United States National Museum
International Exchanges
Bureau of Ethnology
National Zoological Park
Astrophysical Observatory

THE SMITHSONIAN INSTITUTION

"FOR THE INCREASE AND DIFFUSION OF KNOWLEDGE AMONG MEN"

TO THE AMERICAN PHILOSOPHICAL SOCIETY

"FOR PROMOTING USEFUL KNOWLEDGE"

GREETING

On the two hundredth anniversary of the birth of Benjamin Franklin, Founder and first President of the American Philosophical Society the

Smithsonian Institution congratulates the Society on its long and prosperous existence and on the achievements of its membership in the fields of philosophy and natural science

Philosophy "the mother and nurse of all sciences," has had no more devoted student than Benjamin Franklin. Honored by learned societies and universities, by his fellow citizens, by potentates, philosophers, and the populace of Europe, his name will ever stand among the highest of eminent Americans. The results of his researches in philosophical subjects and in electrical science are clear and convincing—the work of a strong, original, comprehensive intellect. His conciliatory methods and independence of character, and his genial disposition in his efforts, with the aid of Chatham, Pitt, and Burke, to avert the political separation of England and America, his service in the negotiation of treaties of commerce and alliance with France, and of the treaty of peace with Great Britain, place him in the front rank of American diplomatists. The deliberations of the Continental Congress on the Declaration of Independence, and the debates of the Constitutional Convention were guided largely by his keenness of perception and his sound common sense

The Smithsonian Institution congratulates itself that one of its first Regents Richard Rush, of Philadelphia,

whose efforts signally contributed to the securing of the Smithsonian bequest, and its three Secretaries Joseph Henry, Spencer F. Baird, and S. P. Langley were members of the American Philosophical Society, whose rolls likewise bear the names of Alexander Dallas Bache and Louis Agassiz and other men prominent in statesmanship and science, who are closely connected with the history of the Institution. "On the shoulders of young Henry," said Sir David Brewster, "has fallen the mantle of Franklin." The discovery by Franklin of the identity of lightning and the electrical fluid enables man to make the lightning harmless; the discovery by Henry of the laws by which the effective power of the electro-magnet could be made active, renders possible in the service of man the telegraph and the telephone, and the daily application of electro-motive power in ways innumerable

The American Philosophical Society honors science and learning in celebrating the anniversary of the natal day of the illustrious Franklin, who, as the great statesman Turgot declared

"Eripuit coelo fulmen, sceptrumque tyrannis"

(SEAL) R. RATHBUN,
Acting Secretary.

REAL ACADEMIA DE CIENCIAS EXACTAS, FISICAS Y NATURALES

REAL ACADEMIA DE CIENCIAS FISICAS Y NATURALES.

Valverde, 26.—Madrid, 2 de Abril de 1906.

SRES. SECRETARIOS DE

"THE AMERICAN PHILOSOPHICAL SOCIETY."

Sres. Secretarios: Philadelphia.

Muy distinguidos Sres. mios: En la imposibilidad de acudir personalmente los individuos numerarios de esta Academia á la celebración del segundo centenario del nacimiento de Benjamin Franklin, aprovechando la galante intitación de la "American Philosophical Society" de Philadelphia, la Corporación ha acordado dirigir á esa illustre Sociedad el presente mensaje de su más entusiasta adhesión á cuanto signifique honrar la memoria del sabio eminente, gloria de su pátria y honra de la humanidad, cuyo preclaro nombre, popular en el mundo entero, irá siempre unido al de los más ilustres genios de las Ciencias y de los más insignes bienhechores de la humanidad.

De Vds. Sres. Secretarios, con la mayor consideración,

atento s. s
q. ss. mm. b
F. DE P. ARRILLAGA,
Secretario de la Academia.

THE UNIVERSITY OF WISCONSIN

THE UNIVERSITY OF WISCONSIN
EXTENDS TO THE
AMERICAN PHILOSOPHICAL SOCIETY
CORDIAL GREETINGS

upon the celebration of the TWO HUNDREDTH ANNIVERSARY of the birth of BENJAMIN FRANKLIN, and joins therewith assurance of the high esteem in which the MIDDLE WEST holds alike the name of Franklin and the spirit and achievement of the Society that now honors his memory. Emulating that spirit of broad catholicity of human interests so admirably exemplified in Franklin's life, the University unites with the Philosophical Society in holding as an integral part of its province, the increase of knowledge and the widening application of that knowledge to the daily life of mankind. With Franklin, it regards no useful intellectual pursuit as beneath its notice and none too high to fall within its ken.

In admiration for the many-sidedness of Franklin's career, the UNIVERSITY OF WISCONSIN joins with its sister institutions of learning throughout the world in

recognizing him as the herald of that great outburst of science and humanity that is the glory of the nineteenth century, and it cherishes his intellectual temper and spirit as a model for the present age.

THE UNIVERSITY OF WISCONSIN desires also, through these letters, to express its sense of gratitude and obligation to the AMERICAN PHILOSOPHICAL SOCIETY for its service to civilization in worthily commemorating the services of a great man, and in impressing upon the living age, that its inheritance of bettered conditions of life comes not from the heedless majority of ancestors, but from a chosen few, rare spirits among men.

IN TOKEN WHEREOF, there is hereunto set this 17th day of April, 1906, the seal of the University of Wisconsin and the hand of its President.

(SEAL) CHARLES R. VAN HISE,
President.

Attest: E. F. RILEY,
Secretary.

THE ROYAL METEOROLOGICAL SOCIETY

ROYAL METEOROLOGICAL SOCIETY
PRINCES MANSIONS,
70, VICTORIA STREET,
S. W.

April 3, 1906.

TO THE PRESIDENT OF THE PHILOSOPHICAL SOCIETY OF AMERICA.

Sir:

The agreeable duty falls to me of tendering to you, on behalf of the Council and Fellows of the Royal Meteorological Society of London our cordial thanks for the invitation received to participate in the proceedings of your time-honored Society on the celebration of the birth of its illustrious founder, Benjamin Franklin.

Sir George Darwin, whom we have asked to be our representative on this historic occasion, will convey to you and the members of the Philosophical Society our hearty appreciation of the tribute you are justly paying to the memory of one, to whom Science is so greatly indebted, and to whom we ourselves owe much for his researches in various branches of Meteorology.

It would have been a source of much gratification to the great Franklin could he have survived to witness

the full restoration of those close ties of friendship which now happily unite the great English speaking nations on both sides of the Atlantic, no less than to feel the high appreciation in which his character and work is held in both countries two centuries after his birth.

With very hearty wishes for the successful commemoration of the two-hundredth anniversary of the birth of Franklin from all the Fellows of this Society,

I remain, Sir,

Yours faithfully,

RICHARD BENTLEY,
President of the Royal
Meteorological Society.

K.K. ZOOLOGISCH-BOTANISCHE GESELLSCHAFT

Wien, am 6 April, 1906.

K.K. ZOOLOGISCH-BOTANISCHE
GESELLSCHAFT
WIEN, I., WOLLZEILE 12.

AN
DIE HOCHVEREHRLICHE
PHILOSOPHICAL SOCIETY
IN
PHILADELPHIA.

Das ergebenst gefertigte Praesidium der k.k. zoologisch-botanischen Gesellschaft in Wien beehrt sich, anlässlich der Franklin-Feier die herzlichsten und wärmsten Gluckwünsche zum Ausdruck zu bringen.

Leider ist es der k.k. zoologisch-botanischen Gesellschaft unmöglich, einen Vertreter zu entsenden. Doch wollen Sie davon überzeugt sein, dass sie lebhaften Anteil nimmt an dem erhebenden Feste, das ebenso dem Andenken Ihres berühmten Landsmannes gilt, wie der Erinnerung an die hervorragenden Leistungen Ihrer Gesellschaft.

Es zeichnet sich mit dem Ausdrucke vorzüglicher Hochachtung

das Praesidium

der k.k. zoologisch-botanischen Gesellschaft.

PROF. DR. R. v. WETTSTEIN,
Praesident.

DR. F. VIERHAPPER,
Sekretär.

DIE NATURFORSCHER-GESELLSCHAFT, DORPAT

DIE NATURFORSCHER-GESELLSCHAFT BEI DER
KAISERLICHEN UNIVERSTAET DORPAT
ENTBIETET DER
AMERICAN PHILOSOPHICAL
SOCIETY
IN PHILADELPHIA
ZUR FEIER DER ZWEIHUNDERTSTEN WIEDERKEHR
DES GEBURTSTAGES
IHRES BEGRÜNDERS
BENJAMIN FRANKLIN

die wärmsten Wünsche des ferneren Gedeihens und weiterer erfolgreicher wissenschaftlicher Thätigkeit zum Wohle der Menschheit.

Präsident, PROF. N. J. KUSNEZOW.

Dorpat, März, 1906.

DE KONINKLIJKE AKADEMIE VAN WETENSCHAPPEN TE AMSTERDAM

De Koninklijke Akademie van Wetenschappen te Amsterdam acht het een groot voorrecht in de gelegenheid te zijn om hare bewondering en eerbied uitte-spreken voor

BENJAMIN FRANKLIN,

bij gelegenheid der herdenking, door de American Philosophical Society te Philadelphia, van zijn

200STEN GEBOORTEDAG

Voorbeeld van een onderzoeker, die alleen met de eenvoudigste hulpmiddelen werkte en die in de mededeeling zijner ontdekkingen niet minder bewonderenswaardig was dan in deze zelf, wist FRANKLIN aan tal van nauw merkbare verschijnselen gedachten van waarde vastteknoopen. In het licht van tengenwoordige theorien krijgen zijn vondsten over de ontladende werking van vlammen, en van die van rood gloeiend ijzer opnieuw beteekenis.

Zijne theorie der electriciteit heeft in zijn tijd krachtig bijgedragen tot verheldering der inzichten en zijne

onderzockingen over atmospharische electriciteit waren baanbrekend.

Voor alle tijden zal Franklin's naam verbonden blijven aan de uitvinding van den bliksemafleider. Hij heeft dus in een schitterend voorbeeld met nadruk geleerd: NATURAE NON IMPERATUR, NISI PARENDO.

De Koninklijke Akademie van Wetenschappen te Amsterdam, hulde brengend aan de nagedachtenis van dezen denker, eerbied gevoelend voor zijn groot en oorspronkelijk karakter, roept een warmen heilwensch toe aan het geboorteland van BENJAMIN FRANKLIN en aan de AMERICAN PHILOSOPHICAL SOCIETY die hem herdenkt.

Het Bestuur der Koninklijke Akademie van Wetenschappen,

H. G. VDS. BAKHUIJZEN,
Algemeen Voorzitter.

J. D. VD. WAALS,
Algemeen Secretaris.

THE ACADEMY OF SCIENCES OF ST. LOUIS

THE ACADEMY OF SCIENCES OF ST. LOUIS

PRESENTS ITS CONGRATULATIONS AND BEST WISHES

TO

THE AMERICAN PHILOSOPHICAL SOCIETY,

ON THE BI-CENTENNIAL CELEBRATION

OF THE BIRTH OF ITS GREAT FOUNDER

BENJAMIN FRANKLIN.

The Academy gladly joins in doing honor to the memory of him who was above all, and in the highest sense, the friend of man.

(SEAL) ADOLF ALT.

ERNEST P. OLSHAUSEN, President.
Recording Secretary.

H. AUG. HUNICKE,
Corresponding Secretary.

THE GEOLOGICAL SOCIETY OF GLASGOW

THE GEOLOGICAL SOCIETY OF GLASGOW

TO

THE AMERICAN PHILOSOPHICAL SOCIETY HELD AT PHILADELPHIA,

FOR PROMOTING USEFUL KNOWLEDGE.

We, the members of the Geological Society of Glasgow, gladly accept the courteous invitation of the American Philosophical Society for Promoting Useful Knowledge, to take part in celebrating the bi-centenary of the birth of its founder, Benjamin Franklin, and offer our cordial congratulations on the prosperity of the Society, and the generous spirit shown in the arrangements for this great commemoration.

We contrast with wonder the small beginnings of the American Philosophical Society, and the high and honourable position which it now occupies among kindred institutions throughout the World; the brief list of eager seekers after knowledge whom Franklin drew together, and the long roll of Members, of all nationalities, distinguished in all branches of learning, on which it is the ambition of even the most eminent to see his

name inscribed. On this roll we recognize the names of many who have been foremost in advancing the science to which we are specially devoted.

We have the fullest confidence that the grand constitution bequeathed to the American Philosophical Society, the stimulus of its noble traditions, and the loyalty of its Members will continue to augment its influence and increase its power for Promoting Useful Knowledge,

On behalf of the Geological Society of Glasgow.

BEN. N. PEACH,

LL.D., F.R.S., A.R.S.M., President.

THE BUFFALO SOCIETY OF NATURAL SCIENCES

THE BUFFALO SOCIETY OF NATURAL SCIENCES
OF BUFFALO, N. Y.

(ORGANIZED, 1861. INCORPORATED, 1863)

Acknowledges with pleasure the invitation of

THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA FOR PROMOTING USEFUL KNOWLEDGE, 1743

To be represented at
The Celebration of the Two Hundredth Anniversary of the Birth of its Founder
To be held in Philadelphia, April 17, 18, 19 and 20, 1906
The Society takes this opportunity of felicitating
The American Philosophical Society
on this auspicious occasion, and will be
represented by its President
Thomas Guilford Smith, A.M., C.E., LL.D.
to convey in person its cordial greeting and congratulation

By order of the Board of Managers

ELIZABETH J. LITSON,
(SEAL) Director of the Museum.
CARLOS E. CUMMINGS, A.B., M.D.
Buffalo, April 2, 1906 Secretary.

JARDIN BOTANIQUE DE L'ETAT

JARDIN BOTANIQUE
DE
L'ETAT.

(SEAL)

Bruxelles, le 8 Mars, 1906.

A LA CÉLÈBRE AMERICAN PHILOSOPHICAL SOCIETY OF PHILADELPHIA FOR PROMOTING USEFUL KNOWLEDGE.

La Société royale de botanique de Belgique a été fort sensible à la gracieuse invitation que vous avez bien voulu lui adresser de se faire représenter aux fêtes solennelles que vous organisez du 17 au 20 avril prochain pour glorifier le souvenir du 200ème anniversaire de la naissance de votre illustre fondateur Benjamin Franklin. Elle ne pourra malheureusement pas vous envoyer de délégué, mais elle tient à vous dire qu'elle s'associe de tout coeur à ce suprême hommage rendu à un homme qui appartient à la collectivité de l'humanité à cause des bienfaits dont elle lui est redevable, mais qui est aussi une des gloires les plus éclatantes et les plus pures des États Unis.

Bruxelles, le 8 Mars, 1906.

(SEAL)

Pour la Société,
TH. DURAND,
Secrétaire Général.

THE COLLEGE OF SCIENCE, IMPERIAL UNIVERSITY, TOKYO

(TRANSLATION)

The College of Science, Imperial University, Tokyo, feels very much honored by receiving your kind invitation to participate in the Celebration to be held in Philadelphia in April of the present year on the occasion of the two-hundredth anniversary of the birth of Benjamin Franklin, the illustrious Founder of your Society and one of the world's great men. We regret that circumstances prevent our sending a special delegate to represent us in the Celebration, but we desire to send at least a few words of congratulation expressing the spirit and great work of Franklin to the posterity.

We remain, Respectfully yours,

K. MITSUKURI, PH.D.,
Director of the College of Science,
Imperial University, Tokyo.

To the American Philosophical Society,
Philadelphia, Penn., U. S. A.

IMPERATORSKOIE OBSHCHESTVO LUBITELEI IESTESTVOZNANIA, ANTROPOLOGII I ETNOGRAFII

(SEAL)

The Imperial Society of Lovers of Natural Science, Anthropology and Ethnology held at the Imperial University at Moscow has the honour to congratulate the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge with the celebration of the two-hundredth anniversary of the birth of its founder, the famous citizen and naturalist Benjamin Franklin, and to wish the oldest of scientific societies a happy continuation of its brilliant existence and valuable work.

President, NICHOLAS JOUKOOSKY,
Secretary, WLADIMIR ELPATIEWSKY,
Members of Council, WSEWOLOD MILLER,
LEO MOROCHOWETZ,
ALEXANDER SABANEJEFF,
GREGORIOUS KOSHEVNIKOV,
WLADIMIR TICHOMIROW,
COMTESSE OUDEREFF,
E. LEYST,
PETER PETROFF,
NICHOLAD ZOGRAF.

THE PHYSICAL SECTION OF THE RUSSIAN PHYSICO-CHEMICAL SOCIETY

TO THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA
FOR PROMOTING USEFUL KNOWLEDGE.

The Physical Section of the Russian Physico-Chemical Society congratulates the American Philosophical Society on the occasion of the Two Hundredth Anniversary of the birth of Benjamin Franklin.

That name reminds every one of us of the luminous kingdom of Ideals and Understanding.

The Russian children in one of their earliest books read the biography of B. Franklin as a paragon of virtue; the school boys learn by the example of Franklin how the brave mind overcomes the formidable appearances of nature by its fundamental investigations; the image of the famous leader of the great American people rises before the citizens of Great Russia at the time of her new stage of the liberating evolution.

The Meeting of April of the Physical Section will be consecrated to the researches of Benjamin Franklin as

the founder of the simplest and the most profound electrical theory now reviving as a fine flower in the scientific field manured by the wonderful discoveries of the last years.

President of the Physical Section,
PROFESSOR N. HESEHUS.

St. Petersburg,
11 (24) March, 1906.

DEUTSCHER SEEFISCHEREI-VEREIN

DEUTSCHER SEEFISCHEREI-VEREIN
UNTER DEM
ALLERHOECHSTEN PROTEKTORAT SEINER MAJESTAT DES KAISERS.

Hannover, dem 9. März, 1096.

Sehr geehrte Herren:

Mit verbindlichstem Danke bestatigen wir den Empfang der sehr freundlichen Einladung zu der vom 17. bis 20." April d. Js. stattfindenden Franklin-Feier. Da wir bei der Bedeutung dieser Feier dem Wunsch haben, eindrucksvoller vertreten zu sein, als es auf schriftlichem Wege möglich ist, so haben wir unser korrespondierendes Mitglied, Herrn Dr. Hermann Boeker in New-York (227 East 57 Str.) gebeten, während der Eröffnungsfeier als unser Vertreter zugegen zu sein. Herr Boeker hat sich freundlichst bereit erklärt, diesen Auftrag zu übernehmen. Wir haben die Ehre Sie hiervon mit unseren besten Wunschen für ein gutes Gelingen der Feier in Kenntniss zu setzen.

Mit dem Ausdruck vollkommener Hochachtung
Deutscher Seefischerei-Verein.
gez. Herwig.

An die AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia, Independence Square.

INSTITUTION OF ELECTRICAL ENGINEERS

TO THE
PRESIDENT AND COUNCIL
OF THE
AMERICAN PHILOSOPHICAL SOCIETY FOR
PROMOTING USEFUL KNOWLEDGE.

WE, the President, the Council and Members of the INSTITUTION OF ELECTRICAL ENGINEERS desire to convey to you our most cordial greetings on the occasion of the celebrations commemorative of the 200th Anniversary of the birth of BENJAMIN FRANKLIN that illustrious Pioneer in the field of Electrical Science.

As fellow workers in the promotion of useful knowledge and the advancement of Science it is our privilege to unite with you, our kinsmen, in paying a grateful tribute to the immortal genius of the Founder of your honourable and learned Society, by the institution of which he laid the sure foundation for continued progress in the future, progress to which his own fruitful labours in the field of Electrical Science have contributed so largely.

DATED this Twenty-ninth day of March, 1906.

(SEAL)

J. GAVEY,
President.

WILLIAM H. PATCHELL,
Member of Council.

G. C. LLOYD,
Secretary.

SOCIÉTÉ FRIBOURGEOISE DES SCIENCES NATURELLES

(SEAL)

Fribourg (Suisse), le 5 Mars, 1906.

A L'AMERICAN PHILOSOPHICAL SOCIETY

À PHILADELPHIE.

Monsieur le Président,

Messieurs,

Vous nous avez fait l'honneur de nous inviter à la fête que vous organisez pour célébrer, au mois d'avril prochain, le deuxième centenaire de la naissance de Benjamin Franklin! Nous en sommes très flattés et venons vous en exprimer toute notre reconnaissance.

Les Suisses, dont l'horizon est borné par de hautes montagnes, ne sont généralement pas habitués aux grandes distances et s'en laissent facilement effrayer, aussi ne nous sera-t-il pas possible de nous faire représenter à votre fête et de répondre à votre aimable invitation.

Nous tenons cependant à nous associer à l'hommage légitime que la Science universelle se prépare à rendre à la mémoire de Benjamin Franklin.

L'illustre savant a eu non seulement le rare mérite de triompher de l'isolement et de la pénurie de moyens de travail et de recherche, mais les idées qu'il a émises sur la nature de l'électricité sont trop analogues aux théories modernes pour que l'anniversaire que vous allez célébrer n'en tire pas un éclat particulier.

Enfin. la Suisse, qui a si péniblement conquis son indépendance, ne peut s'empêcher d'associer au souvenir du savant, celui de l'homme d'État qui a fait l'Amérique indépendante et libre.

C'est dans ces idées, Monsieur le Président et Messieurs, que nous faisons des voeux pour le plein succès de la fête de Franklin et que nous vous prions d'agréer l'assurance de notre haute considération.

Par décision de la Société fribourgeoise des Sciences naturelles.

Le Sécrétaire,
DR. LS. GOBET, Prof.

Le Président,
PROF. M. MUSY.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

AMERICAN PHILOSOPHICAL SOCIETY

HELD AT PHILADELPHIA

GREETINGS FROM THE

PHILOSOPHICAL SOCIETY OF WASHINGTON

AND CONGRATULATIONS ON THIS CELEBRATION

OF THE

BICENTENNIAL ANNIVERSARY

OF THE BIRTH OF ITS DISTINGUISHED FOUNDER

BENJAMIN FRANKLIN

PROMOTER OF SCIENCE AND FRIEND OF HUMANITY

GEORGE K. BURGESS,
Secretary.

CLEVELAND ABBE,
President.

SOCIÉTÉ GÉOLOGIQUE DE BELGIQUE

Mr. President:

Neither the Sociéte Géologique de Belgique, which charges me to convey its greetings to the American Philosophical Society on this memorable occasion, nor the present Kingdom of Belgium, of which it is the national representative in the Science of Geology, existed, at the date of the death of Benjamin Franklin; yet genius like his commands the reverence of all ages, and along with its tribute to his memory the Society desires me to present the assurance of its sympathy and affiliation with the oldest learned Society of America, offspring of the great printer and conducting this well deserved service of commemoration to him.

Founded by Gustave Dewalque and Adolphe Firket, both of whom have passed away almost within the last year, the Société Géologique de Belgique during their lifetime, and largely through their efforts, aided by those of their learned colleagues and countrymen, has risen not only to the rank of the premier geological society of Belgium, but to eminence among the greatest learned Societies of Europe. One characteristic of its publications, aside from their intrinsic scientific value,

would have endeared them to the man who at the close of his useful life and after having reached the summit in each of the departments in which his great abilities served mankind, described himself as a "printer." The typography of the publications of this Society has ever been of the highest order of excellence, though it would not be fitting in its representative to say so were it not for the obvious connection with Franklin's favorite art.

For the great scientific men in the American Philosophical Society the Société géologique de Belgique has always had the highest appreciation; publishing from time to time abstracts of their discoveries during their life time, and eulogistic notices on their death. It enters heartily into the spirit of these services and through me sends its homages to the memory of the great man who is the object of them and to the Society which he founded.

PERSIFOR FRAZER,
Membre honoraire and Delegate of the
Société géologique de Belgique.

SOCIEDAD CIENTIFICA "ANTONIO ALZATE"

Mr. President:

The Sociedad Cientifica "Antonio Alzate" derives its name from the distinguished Mexican Naturalist who was born seventeen years after the object of our present commemorative services, and died in the same year. While Franklin was discovering atmospheric electricity and assisting in the founding of a great nation, Antonio Alzate, a corresponding member of the French and Spanish Academies of Science, was publishing the Gaceta de Literatura, and determining the limit of perpetual snow on the Volcano of Popocatepetl, besides making important contributions to Botany and Zoology. The Society which has adopted his name for its own is the most important Natural History Society on the Continent south of the United States, and adds to the Pan-American feeling which hails Franklin as a great Western Continent patriot, also enthusiasm for the great observer and master of research. Along with my two colleagues, members of this Society, I am desired to express the satisfaction of the Society Antonio Alzate at having been honored by the American Philosophical Society with an invitation to participate in these cere-

monies; and to express to its older sister Society the feelings of warm cordiality and friendship with which that invitation was received. The "Antonio Alzate" has invited and published in its Memorias y Revista communications from Scientific men of all nations, and especially from the United States. These valuable contributions to science have been printed, each in the language of its author, and the closest sympathy and fellowship have been exhibited by it through its eminent permanent Secretary Senor Rafael Aguilar for the many eminent scientific members of the American Philosophical Society. It requests us, its delegates, to express to the latter its warm coöperation in the spirit of this bi-centenary.

PERSIFOR FRAZER,

Honorary member and one of the delegates of the Sociedad Antonio Alzate.

THE TOKYO BOTANICAL SOCIETY

THE WORDS OF CELEBRATION.

(SHU KUJI)

THE TOKYO BOTANICAL SOCIETY.

The Tokyo Botanical Society cordially congratulates the American Philosophical Society on the celebration of the two-hundredth anniversary of the birth of their founder,

BENJAMIN FRANKLIN.

April Seventeenth,
thirty-ninth year of Meiji.

PROF. JINZO MATSUMURA,
President of the
Tokyo Botanical Society.

THE TOKYO ZOOLOGICAL SOCIETY

(TRANSLATION)

The Tokyo Zoological Society offer congratulations to the American Philosophical Society of Philadelphia on the occasion of the Celebration of the Two-Hundredth Anniversary of the birth of its illustrious Founder, Benjamin Franklin.

K. MITSUKURI, PH.D.,
President of Tokyo Zoological Society.
College of Science,
Imperial University,
Tokyo, Japan.

ASSOCIATION DES INGÉNIEURS ÉLECTRICIENS SORTIS-DE L'INSTITUT ÉLECTROTECHNIQUE MONTEFIORE

UNION PROFESSIONELLE RECONNUE

SIÉGE SOCIAL: RUE SAINT GILLES, 31, LIÉGE.

Messieurs,

L'Association des Ingénieurs électriciens sortis de l'Institut électrotechnique Montefiore, très-sensible à l'honneur que vous lui faites en l'invitant à participer aux cérémonies commémoratives de Benjamin Franklin, avait décidé de se faire représenter à cette solennité par un de ses membres.

Un empêchement de son délégué, dont elle vient seulement d'être prévenue, l' oblige à borner sa participation a l'envoi de cette adresse, qui vous dira combien nous sommes tous de coeur avec vous dans la célébration de l'homme qui illustra votre patrie à l'aurore de son indépendance.

Si Franklin fut, comme citoyen, une des gloires de l'Amérique, il appartient, comme savant, à la science universelle, et, comme philosophe, au monde entier.

C'est pourquoi, en nous unissant à vous dans ces heures de manifestation nationale, nous payons aussi une dette

de reconnaissance envers celui qui fut, l'honneur de l'humanité.

Veuillez bien agréer, Messieurs, l'expression de nos sentiments de parfaite considération.

Au nom du Comité scientifique,

Le Secrétaire perpétuel, Le Président,

G. L'HOEST. LOUIS BRUNHES.

Liége, le Mars, 1906.

THE AMERICAN PHILOSOPHICAL SOCIETY,

Philadelphie, (U. S. A.)

THE GEOLOGICAL SOCIETY OF AMERICA

Mr. President:

The Geological Society of America contained in 1904 259 Fellows representing the active established Geologists of the United States. At present in its nineteenth year it may well be regarded as the mouth-piece of geological Science in this Country. I am requested by its President, Prof. Russell, to express to the American Philosophical Society the active and sympathetic interest taken by the Geological Society of America, both in the ceremonies which have for their object the perpetuation of the memory of one who was perhaps the greatest man this Continent has produced, and also in the venerable sister Society which encloses within her realm not only all Sciences, but all arts and all humanities.

The Geological Society of America, like that of Belgium and Mexico, exhibits its cordial feeling in no perfunctory way towards this creation of Franklin's far sighted sagacity; for Rogers and Lesley, and Leidy, and Cope, all members of the American Philosophical Society, have made it necessary for the geologists of the world to scan the pages of its Proceedings and Transactions in order to keep abreast of the Science. The Geological Society of America, though yet in its teens,

is vigorous and mature, and merely reverses the happy greeting of Brugsch Bey in forwarding the Egyptological exhibit to the United States Centennial Exhibition held in this city in 1876, by expressing its deep and patriotic interest in the honors paid to the memory of our great American, and adding the sincerest and most affectionate greetings from the youngest to the oldest Society in America.

PERSIFOR FRAZER,
Original Fellow and Delegate of the
Geological Society of America.

THE MISSOURI BOTANICAL GARDEN

THE MISSOURI BOTANICAL GARDEN
RECOGNIZING THE GREAT VALUE TO AMERICAN SCIENCE
OF THE STUDIES AND PRECEPTS OF
BENJAMIN FRANKLIN
FOUNDER OF
THE AMERICAN PHILOSOPHICAL SOCIETY

the oldest of American scientific societies, tenders its compliments and felicitations on the occasion of the Two Hundredth Anniversary of the Birth of Benjamin Franklin and delegates The Director of the Garden as its representative at the ceremonies of April 17, 18, 19, and 20, 1906.

St. Louis, Missouri, April 17th, 1906.

WILLIAM TRELEASE,
Director.

R. J. LACKLAND,
President of Board of Trustees.

A. D. CUNNINGHAM,
Secretary of Board of Trustees.

THE COLONIAL SOCIETY OF MASSACHUSETTS

THE COLONIAL SOCIETY OF MASSACHUSETTS

TO

THE AMERICAN PHILOSOPHICAL SOCIETY

GREETING:

In addressing your ancient and distinguished Society on an occasion at once so memorable and so auspicious as the Two Hundredth Anniversary of your Founder's Birth, it would ill become us to use many words, being, as we are, among the youngest of the many bodies — academic, literary, scientific, and historical — that press forward to felicitate you and to do honor to BENJAMIN FRANKLIN. Nor is it needful that we should recite facts which are enrolled in the annals of our Country, and which are familiar to all citizens of the Republic of Letters.

Yet we have deemed it fitting to put on record our sense of the profound significance of this day, and we have, accordingly, delegated our Associate, HENRY HERBERT EDES, to offer to your Society an expression of our sentiments of respect and congratulation.

May your Society, which preserves in its name and exemplifies in its practice the old and all-inclusive meaning of the term Philosophy, long continue to maintain and propagate the traditions that you derive from a Founder who took all useful knowledge for his province, who was a Citizen of the World, and whose chief concern was the amelioration of mankind.

"Courage, wisdom, integrity, and honor," wrote Benjamin Franklin, "are not to be measured by the sphere assigned them to act in, but by the trials they undergo, and the vouchers they furnish; and, if so manifested, need neither robes nor titles to set them off."

THE COLONIAL SOCIETY OF MASSACHUSETTS.

GEORGE LYMAN KITTRIDGE,
President.

JOHN NOBLE,
Corresponding Secretary.

Boston, the seventeenth day of
April, nineteen hundred and six.

(SEAL)

THE CARNEGIE MUSEUM

THE CARNEGIE MUSEUM
DEPARTMENT OF THE CARNEGIE INSTITUTE
PITTSBURGH, PA.
THE CARNEGIE MUSEUM THROUGH ITS DIRECTOR CONGRATULATES THE
AMERICAN PHILOSOPHICAL SOCIETY UPON ITS DECISION
TO CELEBRATE THE TWO HUNDREDTH ANNIVERSARY
OF THE BIRTH OF ITS DISTINGUISHED FOUNDER
BENJAMIN FRANKLIN.

Over the entrance of the Pavilion of Science in the Institute which has been founded in the city of Pittsburgh by one of her honored citizens, we have placed with other glorious names the name of Franklin, the wisest man of his day and generation, a high priest of science, the most famous of all PENNSYLVANIANS, one of the greatest AMERICANS. We feel that the largest structure, which has as yet been erected in America for the advancement of literature, science, and art, is honored by being permitted to bear over its main portal

his name. We honor Franklin, and with peculiar satisfaction join with you in publicly expressing our appreciation of his worth.

On behalf of the Carnegie Museum,

W. J. HOLLAND,
Director.

April 17, 1906.

THE WASHINGTON ACADEMY OF SCIENCES

THE WASHINGTON ACADEMY OF SCIENCES

TO THE

"THE AMERICAN PHILOSOPHICAL SOCIETY"

HELD AT

PHILADELPHIA,

SENDS GREETING AND CONGRATULATIONS ON THIS

TWO HUNDREDTH ANNIVERSARY

OF THE BIRTH OF ITS FOUNDER THE DISTINGUISHED

STATESMAN AND PHILOSOPHER

BENJAMIN FRANKLIN.

BY ORDER OF THE ACADEMY.

(SEAL) CHARLES D. WALCOTT,

President.

THE CARNEGIE INSTITUTION OF WASHINGTON

THE TRUSTEES
OF THE
CARNEGIE INSTITUTION OF WASHINGTON
EXTEND GREETINGS TO
THE AMERICAN PHILOSOPHICAL SOCIETY
HELD AT PHILADELPHIA FOR
PROMOTING USEFUL KNOWLEDGE
ON THE OCCASION OF THE
CELEBRATION OF THE
TWO HUNDREDTH ANNIVERSARY
OF THE BIRTH OF THE
FOUNDER
BENJAMIN FRANKLIN
STATESMAN, HUMANIST, SEER, SCIENTIST,
THE WISEST AND THE SANEST OF AMERICANS.

ROBERT S. WOODWARD,
President.

CABLEGRAMS

REALE ACADEMIA DEI LINCEI

Rome, April 16, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Independence Square, Philadelphia.

Reale Academia Lincei prende vivissima parte solenni onoranze à Benjamino Franklin grande sperimentatore, pensatore e statista.

Presidente, BLASERNA.

L'ACADÉMIE DES SCIENCES DE PARIS

Paris, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

Académie en séance exprime sa sympathie et ses voeux pour la science américaine.

POINCARÉ,
BERTHELOT,
DARBOUX.

L'ACADEMIE IMPERIALE DES SCIENCES DE ST. PETERSBOURG

St. Petersburg, April 14, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

Académie Impériale des Sciences de St. Pétersbourg présente chaleureuses félicitations pour la deuxième centenaire de la naissance de l'illustre savant. Gloire à Benjamin Franklin.

President, CONSTANTIN,
Grand Duc de Russie.

DET KONGELIGE DANSKE VIDENSKABERNES SELSKAB

Copenhagen, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

Hearty congratulations to the Memorial Celebration of your world renowned countryman, Benjamin Franklin, about whom a contemporary wrote, "Eripuit coelo fulmen sceptrumque tyrannis."

For The Royal Danish Society,
JULIUS THOMSEN,
President.

KONGLIGA VETENSKAPS OCH VITTERHETS SAMHÄLLET

Gothenburg, April 18, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

Scientific-Literary Society of Gothenburg sends heartfelt congratulations in commemoration of your glorious founder,

KOESTER,
VISING.

KAISERLICHE AKADEMIE DER WISSENSCHAFTEN

Wien, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Independence Square, Philadelphia.

Kaiserliche Akademie der Wissenschaften nimmt in Bewunderung euer Franklin teil an Ihren Huldigungen.

SUESS,
LANG.

BERLINER GESELLSCHAFT FUR ANTHROPOLOGIE, ETHNOLOGIE UND URGESCHICHTE

Berlin, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

May our venerable sister successfully work on in youth and glory.

BERLIN ANTHROPOLOGICAL SOCIETY.

THE INSTITUTION OF ELECTRICAL ENGINEERS

London, April 18, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

President and Council Institution Electrical Engineers send cordial greetings on Franklin Bi-Centenary celebrations.

SÄLLSKAPET FÖR FINLANDS GEOGRAFI

Helsingfors, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Philadelphia.

On the occasion of the Celebration of the great memory of Benjamin Franklin, the noble champion of science and humanity, The Finnish Geographical Society desire to pay their humble homage and offer their congratulations to the Philosophical Society.

SUNDELL,
Vorsitzender.
PALMÉN,
Sekretär.

TELEGRAMS

THE MAGNETIC CLUB

New York, April 17, 1906.

TO ANDREW CARNEGIE,

Care of The American Philosophical Society.

Magnetic Club banquet on Franklin Anniversary has sent a message in your care as a brother telegrapher, requesting you to present and read it at the proper moment. Gathering large and representative.

T. C. MARTIN.

New York, April 17, 1906.

TO ANDREW CARNEGIE,

Care of The American Philosophical Society.

The Magnetic Club, in banquet assembled to-night in New York, its members and guests representative of the telegraphic and other electrical industries of America, requests you to associate it with the great celebration in honor of Benjamin Franklin, the first American electrician, congratulating the Society, the University and the City of Brotherly Love on the great and glorious memory thus cherished.

A. B. CHANDLER,
President.

(Dear Mr. Secretary

Pray include with others, and oblige

Yours,

ANDREW CARNEGIE,

Past Telegrapher.)

THE OHIO SOCIETY OF THE SONS OF THE AMERICAN REVOLUTION

Cleveland, Ohio, April 19, 1906.

TO THE CHAIRMAN OF THE BENJAMIN FRANKLIN MEMORIAL CELEBRATION COMMITTEE,
Philadelphia, Pa.

The Ohio Society Sons of the American Revolution in annual session sends greetings.

E. D. GARDINER, President.
W. A. TAYLOR, Secretary.

THE PENNSYLVANIA SOCIETY, NEW YORK

New York, April 17, 1906.

TO THE AMERICAN PHILOSOPHICAL SOCIETY,
Independence Square, Philadelphia.

The Pennsylvania Society in annual meeting in New York on this date congratulates the American Philosophical Society on the opening of its Franklin Bi-Centenary celebration.

BARR FERREE,
Secretary.

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